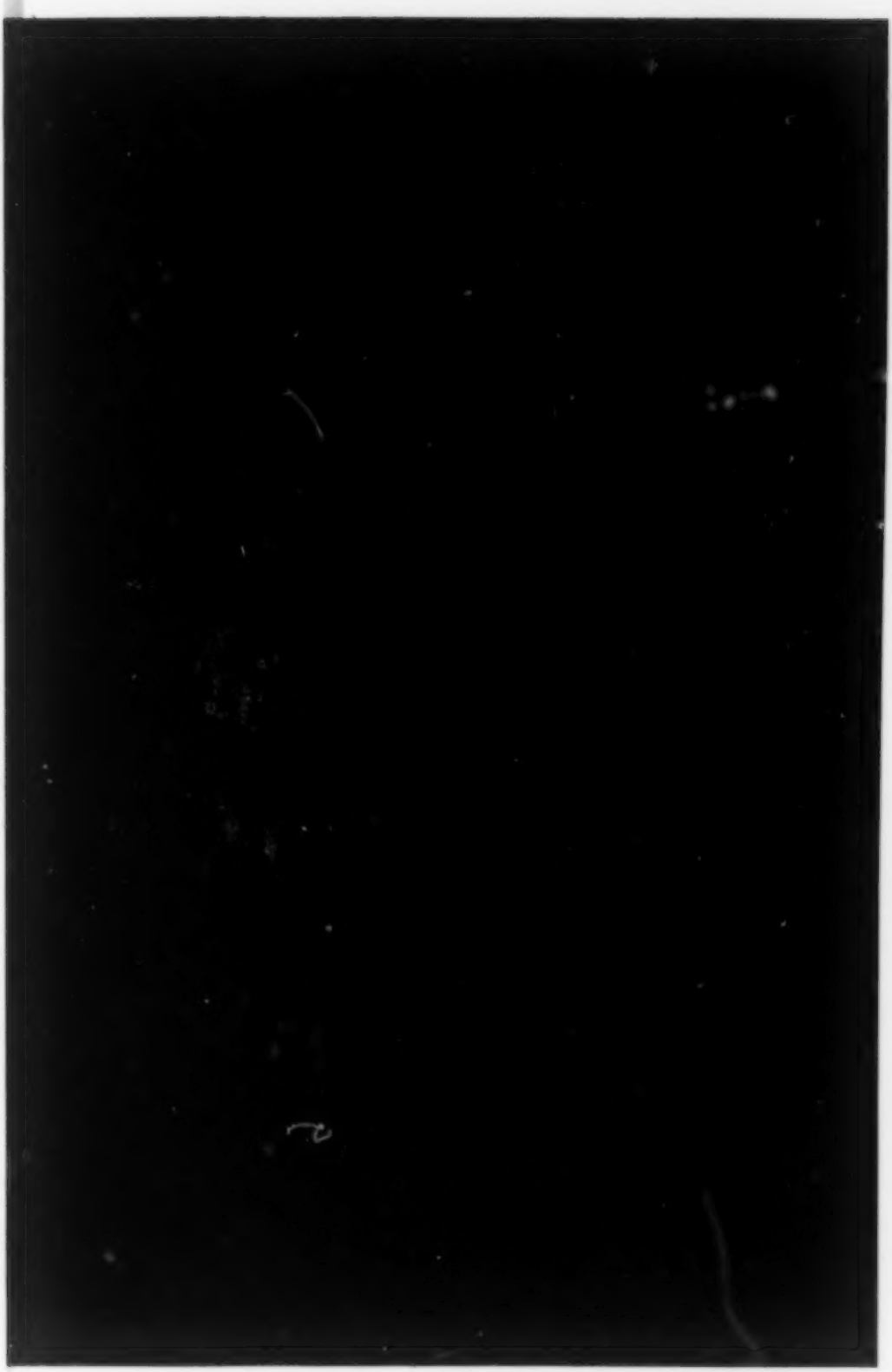

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IN THE

# Supreme Court of the United States

OCTOBER TERM, 1976

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No. 76-419

VERMONT YANKEE NUCLEAR POWER CORPORATION,
*Petitioner*,

v.

NATURAL RESOURCES DEFENSE COUNCIL, INC., et al.,
*Respondents*.

---

No. 76-528

CONSUMERS POWER COMPANY,
*Petitioner*,

v.

NELSON AESCHLIMAN, et al.,
*Respondents*.

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## BRIEF FOR RESPONDENTS NATURAL RESOURCES DEFENSE COUNCIL INC., ET AL. IN NO. 76-419

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### QUESTIONS PRESENTED

1. Does a Court of Appeals act properly when it remands to an agency upon a finding that the agency has promulgated a rule on the basis of a grossly inadequate record?

2. Whether the Court of Appeals was correct in this case when it found the record of the Nuclear Regulatory Commission's "generic" rulemaking proceeding on the environmental impact of the uranium fuel cycle failed to meet either the disclosure requirements of the National Environmental Policy Act, or the Administrative Procedure Act's requirement to engage in reasoned decision-making?

3. Whether a nuclear power station may be licensed to operate with no consideration of the environmental impact of the wastes it will generate?

## THE NUCLEAR FUEL CYCLE

Electricity from nuclear power plants is produced from using the energy released in nuclear fission (splitting the atom) to boil water and create steam. The fissionable material in the present "light water" reactors is uranium-235 ("U-235"). U-235 represents only 0.71 percent of natural uranium. The rest is composed of the heavier isotope, U-238. Within a nuclear power reactor some of this U-238 is converted into a fissionable material, plutonium-239 ("Pu-239"),[1] which itself can be used as reactor fuel, if separated from the remaining uranium and other radioactive waste in a fuel "reprocessing" plant. The spent fuel removed from a nuclear reactor each year contains some 200 kilograms of Pu-239.[2]

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[1] Plutonium is so dangerous that it has been suggested that a single dust particle of plutonium if inhaled might cause lung cancer. Lushbauch & Langham, *A Dermal Lesion from Implanted Plutonium*, 86 ARCHIVES OF DERMATOLOGY at 121-24 (October 1962).

[2] "Final Generic Environmental Statement on the Use of Recycled Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors ("GESMO")," U.S. Nuclear Regulatory Commission, NUREG-0002 (August 1976) II-3.

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Whether or not reprocessed, spent fuel is a highly radioactive waste material, contaminated by vast quantities of radionuclides that must be kept isolated from all life for periods of hundreds to hundreds of thousands of years. In addition, if plutonium-239 is extracted from spent fuel by a reprocessing facility, the resulting refined plutonium fuel can be converted into an atomic weapon with widely disseminated information and technology available to even technologically backward nations or terrorist groups.[3]

### A. The Dangers from Nuclear Wastes.

The Director of the Nuclear Regulatory Commission's Division of Waste Management described the significance of the waste disposal problem in the rulemaking under review here. "Some people," he said,

> "feel that this is the most difficult problem associated with the effective use of nuclear energy to generate electrical energy. . . ."

App. 776.

A radioactive isotope of the element cesium can be used to illustrate the dangers associated with the radioactive wastes. A 1000 megawatt nuclear reactor will at the end of one year's operation have an inventory of about 3 million curies (a measure of radioactivity) of the radioactive isotope, cesium-137 ("Cs-137").[4] By the year 2000, the Nuclear Regulatory Commission ("Commission")[5] projects 500 such reactors.[6] By that time,

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[3] WILLRICH, M. AND TAYLOR, T.B., NUCLEAR THEFT: RISKS AND SAFEGUARDS (Ballinger Publishing Co., Cambridge, Mass. 1974) 5-21.

[4] GESMO, *supra*, IV C-82.

[5] The Nuclear Regulatory Commission succeeded to the authorities relevant to this case formerly possessed by the Atomic Energy Commission during the course of this litigation. Hence the term "Commission" is used tc refer to both bodies throughout this brief.

[6] GESMO, *supra*, S-12.

the Nation's total accumulated inventory of Cs-137 will be approximately 15 billion curies. The International Commission on Radiological Protection has suggested a maximum permissible exposure to Cs-137 for an individual.[7] If only one one-hundred-millionth of the accumulated inventory of Cesium-137 were transferred evenly to the American population projected for that year, this maximum "body burden" would be received by every person in the United States. Moreover, one hundred years later this material will have decayed by only a factor of 10. Similarly, by the year 2000 it is projected that there will be an inventory of plutonium-239 equal to some 10 million billion body burdens.[8] Because of its extremely long "half-life" (decay period), this material will not become harmless for approximately 250,000 years. Thus because of their extreme toxicity and immensely long decay periods, the radioactive materials in nuclear wastes must be isolated from the environment for, essentially, perpetuity.

In 1960, a committee of the National Academy of Sciences concluded that:

> ". . . no existing AEC installation is in a geologically acceptable location for disposal of highly radioactive liquid waste and . . . future waste-producing plants might also be placed in unfavorable locations if the feasibility of safe ultimate disposal is disregarded. The Committee also expressed its belief that there is serious need to get beyond the problems of disposal at existing installations that were located with little regard to ultimate disposal procedures, and to

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[7] International Commission on Radiological Protection ("ICRP") Publication 2, *Report of Committee II on Permissible Dose for International Commission on Radiological Protection* (1959) 60.

[8] GESMO, *supra*, S-16; ICRP, Publication 2, *supra*, 82.

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give additional emphasis to the job of finding safe permanent disposal sites." [9]

Since then, there has been little further progress towards developing an acceptable means of disposing of these wastes. After substantial investigation, in 1971 the Commission decided to begin a demonstration project to demonstrate the feasibility of a permanent disposal facility in an abandoned salt mine at Lyons, Kansas. It claimed before the Joint Committee on Atomic Energy that all the necessary studies confirming the mine's suitability had been completed. Subsequent to the Congressional budget hearings, the Commission's Environmental Impact Statement on the project asserted:

> "By establishing this facility, radioactive wastes of the type previously described [including high-level wastes] will be permanently isolated from man's biosphere, thus providing a direct and lasting benefit to the environment. No significant impact on the environment resulting from the construction or operation of the proposed repository is anticipated." [10]

Citizens, scientists, private organizations, and State officials in Kansas argued vehemently that the Lyons site had not been adequately proven. It developed that they were right and the Commission wrong, for the Commission concluded after further study that the Lyons site was unsuitable:

> "In the course of the investigation, we found that there were several technical problems that had to do with Lyons itself, but not with other salt—the fact

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[9] Committee on Geologic Aspects of Radioactive Waste Disposal, Division of Earth Sciences, National Academy of Sciences/National Research Council, *Report to the Division of Reactor Development and Technology, U.S. Atomic Energy Commission* (May 1966).

[10] U.S. Atomic Energy Commission, "Radioactive Waste Repository, Lyons, Kansas," WASH-1503 (June, 1971) 2.

> that right next door there was another mine that decided it was going to start solution mining. We were only 1,800 feet underground away from the other mine. Solution mining could well have broken through. One thing you cannot have is water in to dissolve the salt, because then the salt is no good. That is the thing that made Lyons no good." [11]

The latest examination of the status of radioactive waste disposal conducted in 1977 by the Government Accounting Office ("GAO"), concluded that the facts still belied the Commission's optimism about waste disposal:

> "After several decades of work, AEC did not, and ERDA has not yet (1) demonstrated acceptable solutions for long-term storage and/or disposal of its high level waste and (2) satisfied the scientific community that present storage sites are geologically suited for long term storage or disposal.[12]
>
> • • • •
>
> The Energy Research and Development Administration has begun a program to demonstrate by the mid-1980's the feasibility and safety of placing radioactive wastes in deep geological formation. GAO points out that not only has progress been negligible to date, but that future program goals are overly optimistic because the Energy Research and Development Administration faces many unsolved social, regulatory, and geological obstacles." [13]

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[11] Dr. Frank K. Pittman, Director of AEC's Waste Management and Transportation Division, *Hearings before a Subcommittee of the Committee on Appropriation, House of Representatives*, 93rd Congress, 1st Session, Part 4, Atomic Energy Commission, 172 (April 5, 1973).

[12] GAO, Report to the Congress by the Comptroller General of the U.S., *Nuclear Energy Dilemma: Disposing of Hazardous Radioactive Waste Safely* (September 9, 1977) 50.

[13] *Id.*, cover page.

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**B. The Risks of Nuclear Proliferation from Reprocessing Plutonium from Spent Fuel.**

The extraction of plutonium from spent fuel from nuclear power plants poses grave problems of nuclear proliferation. It had been thought that non-nuclear nations could be enticed to forego the development of nuclear weapons if they were assured of assistance and cooperation in the development of peaceful nuclear programs. The 1974 explosion of a "nuclear device" by India made from plutonium extracted from the used fuel of nuclear power reactors shattered this theory.

Should the United States develop a major industry to extract plutonium-239 from spent reactor fuel, other nations, non-signatories of the Nuclear Non-Proliferation Treaty, would find it far easier to obtain the material needed to construct nuclear weapons, or to justify reprocessing plants to support their "peaceful" nuclear power stations.

Terrorist groups could also construct "low technology" nuclear bombs from stolen plutonium-239. A recent report of a Task Force on Nuclear Weapons of the Congressional Office of Technology Assessment ("OTA") composed of five nuclear weapons experts either presently or previously employed in the American weapons program, stated that:

> "[A] small group of people, none of whom have ever had access to the classified literature, could possibly design and build a crude nuclear explosive device. They would not necessarily require a great deal of technological equipment or have to undertake any experiments. Only modest machine-shop facilities that could be contracted for without arousing suspicion would be required. The financial resources for acquisition on open markets need not exceed a fraction of a million dollars." [14]

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[14] U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, NUCLEAR PROLIFERATION AND SAFEGUARDS (July 1977) 140-141.

After considering the potential benefits of reprocessing plutonium together with the dangers associated with nuclear weapons proliferation, a panel of experts in an influential Ford Foundation-sponsored study concluded:

> "There is no compelling national interest to be served by reprocessing. There appears to be little, if any, economic incentive and it is unlikely that reprocessing and recycle could proceed without subsidy. The noneconomic benefits of reprocessing are small: fuel supply for LWRs would be little enhanced. . . .
>
> • • • •
>
> Health hazards and new accident risks argue against reprocessing. But the most severe risks from reprocessing and recycle are the increased opportunities for the proliferation of national weapons capabilities and the terrorist danger associated with plutonium in the fuel cycle.
>
> In these circumstances, we believe that reprocessing should be deferred indefinitely by the United States and no effort should be made to subsidize the completion or operation of existing facilities. The United States should work to reduce the cost and improve the availability of alternatives to reprocessing worldwide and seek to restrain separation and use of plutonium." [15]

## STATEMENT OF THE CASE

### A. The Administrative Proceedings.

#### 1. *Proceedings With Regard to the Vermont Yankee Plant.*

In June, 1971, the Commission convened an adjudicatory hearing, as required by its regulations,[16] to consider

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[15] SPURGEON M. KENNY, ET AL., NUCLEAR POWER ISSUES AND CHOICES: A REPORT OF THE NUCLEAR ENERGY POLICY STUDY GROUP, sponsored by the Ford Foundation and administered by the Mitre Corporation, (Ballinger, Cambridge 1977) 333.

[16] 10 C.F.R. Part 2, § 2.700 *et seq.*

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whether to issue an operating license to the Vermont Yankee nuclear power plant. Shortly thereafter, acting pursuant to the decision in *Calvert Cliffs Coordinating Committee, et al.* v. *U. S. Atomic Energy Commission*, 449 F.2d 1109 (D.C. Cir. 1971), the Commission promulgated rules under the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4331, *et seq.*, requiring that at each licensing proceeding, the Atomic Safety & Licensing Board ("Licensing Board") convened to conduct the proceeding should take evidence respecting the environmental impact of licensing the proposed plant. As part of this consideration, the Licensing Boards were to receive into evidence the Commission's Environmental Impact Statement for the facility, but any party to the proceeding was free to offer additional evidence or examine the reasoning and factual premises of the Statement through all the usual adjudicatory procedures. The Commission's rules also directed that in order to issue a license, the Licensing Board must find that the benefits of operating the plant would outweigh its adverse effects on the environment.[17]

Prior to the commencement of the hearing on Vermont Yankee, respondent Natural Resources Defense Council ("NRDC") propounded a series of interrogatories requesting information concerning, *inter alia*, the environmental impact of transportation, reprocessing, and ultimate disposal of the high level radioactive wastes to be produced by Vermont Yankee. The Licensing Board sustained objections to answering these questions from petitioner Vermont Yankee, taking the position that the environmental effects of the wastes generated through the operation of the plant need not be considered when the Licensing Board evaluated the adverse environmental impacts of the Vermont Yankee facility. The Commission's Atomic Safety and Licensing Appeals Board later

[17] 10 C.F.R. Part 51, § 51.52(c).

sustained the Licensing Board's decision.[18] Having exhausted its administrative remedies, respondent NRDC took an appeal to the United States Court of Appeals for the District of Columbia.

### 2. *The Commission's Rulemaking With Regard to the Environmental Effects of the Uranium Fuel Cycle.*

Shortly after this appeal was filed, the Commission eschewed its claim that NEPA did not require consideration of any of the environmental effects of the handling of spent fuel when the Commission proposed to issue a license to a nuclear power station.[19] Paradoxically, with respect to evaluating the environmental effects of other segments of the handling of spent fuel, (particularly waste reprocessing and disposal) it proposed to abandon its normal adjudicatory procedures. Instead, the Commission proposed to convene a rulemaking for the purpose of arriving at factual conclusions regarding the environmental hazards associated with these questions.[20] The procedural rights of the parties to the rulemaking were to be drastically reduced from those afforded by the Commission in its normal adjudicatory licensing proceedings. An in-

[18] In the Matter of Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-56, App. 112, 115.

[19] The environmental impact of transporting spent fuel and "low level wastes" from the nuclear power station to a reprocessing or disposal facility were to be considered along with other environmental issues in the normal adjudicatory licensing proceeding. All other issues respecting the fuel cycle were to remain excluded from the licensing proceeding. *Id.*, App. 115.

[20] "Environmental Effects of the Uranium Fuel Cycle," Notice of Proposed Rulemaking, 37 Fed. Reg. 24191 (Nov. 15, 1972), App. 352.

The "uranium fuel cycle" was defined to encompass each phase of the production, use, and disposition of enriched uranium fuel for the purpose of generating electricity in the current generation of nuclear power stations (so-called "light water reactors"), including the reprocessing of spent fuel from the reactor and the disposal of nuclear waste products, except waste transportation.

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formal hearing was to be held,[21] the Commission announced that

> "The procedural format for the hearing will follow the legislative pattern, and no discovery or cross-examination will be utilized." [22]

The Commission's Notice of Rulemaking set forth two alternative approaches for amending the Commission's regulations. The second, ultimately adopted with minor modifications, proposed that in future licensing proceedings, the Environmental Impact Statement for a proposed plant should include a one page numerical table, "Table S-3," asserted to quantify fully the environmental impacts of the entire nuclear fuel cycle, including those of reprocessing and disposing of nuclear wastes.[23] The notice invited interested persons to "submit comments and suggestions, together with relevant data and information" [24] with respect to the Commission's two proposed rules.

In announcing the proposed rulemaking, the Commission also released a document, entitled "Environmental Survey of the Nuclear Fuel Cycle," ("Survey") dated November 6, 1972, which was to provide "a basis for an informed consideration of the generic question of the environmental impact associated with the uranium fuel cycle in light water cooled nuclear power reactor licensing proceedings." [25] This Survey was to represent the primary evidentiary basis for the rule ultimately promulgated at the conclusion of the rulemaking.

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[21] Notice of Proposed Rulemaking, *supra*, App. 358.

[22] "Environmental Effects of the Uranium Fuel Cycle," Notice of Hearing, 38 Fed. Reg. 49 (January 3, 1973), App. 361.

[23] Notice of Proposed Rulemaking, *supra*, App. 357.

[24] *Id.*, at 356.

[25] *Id.*, App. 355.

### 3. *The "Environmental Survey of the Uranium Fuel Cycle."*

The Survey addressed the environmental effects of reprocessing spent nuclear fuel through a general descriptive discussion of the normal operation of a hypothetical fuel reprocessing plant.[26] While mentioning that one reprocessing facility was then in operation,[27] and two others were under consideration,[28] the Survey did not recount any actual experience with the attempt to contain radioactive materials at the plant then in operation.[29] The chapter on fuel reprocessing was totally silent with respect to the effects on the human environment that might follow from illicit diversion by foreign governments or territorists of refined plutonium from the facility suitable for use in constructing atomic weapons, nor did it assess the probability of such an event or provide any indication of whether the Commission has any plants to prevent it.[30]

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[26] *Survey*, Chapter F, App. 580-609.

[27] *Id.*, at F-10, App. 589. Though the *Survey* stated, in November, 1972, that the operator of the plant, Nuclear Fuel Services, Inc., was considering tripling the plant's capacity, *Id.*, the plant was closed during that year and has since been abandoned. It is estimated that the costs of decontaminating and decommissioning the plant may exceed $600,000,000. Br. *Amicus Curiae* of 24 Named States in Support of Respondents 6.

[28] *Id.*, at F-10 to 11, App. 587.

[29] Some of the experiences which led ultimately to the abandonment of the plant were discussed at length in the "Supplementary Comments of the Union of Concerned Scientists," App. 1108-1151.

[30] *Survey*, Chapter F, App. 580-609. *See* Natural Resources Defense Council v. N.R.C., 539 F.2d 824 (2d Cir. 1976), *cert. granted*, 45 U.S.L.W. 3647 (March 29, 1977), *quoting* the following from a letter to the Commission from the President's Council on Environmental Quality, as follows:

> "The potential impact of the diversion and illicit use of special nuclear materials are well recognized. This threat is so grave that it could determine the acceptability of plutonium recycle as a viable component of this Nation's nuclear electric power system. Thus, we believe that the NRC, the Executive Branch,

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While it addressed the subject of accidents at a reprocessing facility, the Survey's conclusory discussion was confined to "credible" accidents.[31] No definition was provided of what kinds of accidents had been ruled out of consideration with the use of this conclusory term.[32]

Similarly, the Survey's discussion of the handling of highly radioactive (so-called "high level") wastes was confined to a few typed pages,[33] sketching in the most general outline desiderata for an "engineered storage facility" designed to provide "temporary" (100 year) storage for nuclear wastes pending the development of a means for "permanent" isolation of the wastes from all life.[34] Though the "intended life" of the engineered facility was a century, "the Federal government will have the obligation for care and maintenance as long as any waste is stored in the facility." [35] Even after the hoped-for development of a permanent repository for wastes, the Survey added, the federal government "will have the obligation to maintain control over the site in perpetuity." [36] The Survey provided no estimate of the economic resources that would be required by such perpetual surveillance. The Survey's discussion of the possibility of the release of radioactive materials to the environment

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the Congress, and the American people should have the benefit of a full discussion of the diversion and safeguards problem, its impacts, and potential mitigating measures, before any final decisions are made on plutonium recycle."

[31] *Survey, supra*, App. 601-05.

[32] *Id.* Compare the treatment of fuel reprocessing provided in the fuel cycle proceeding with the one considered in *Natural Resources Defense Council* v. *NRC, supra*.

[33] *Id.*, Chapter G, App. 616-618, 619-624.

[34] *Id.*, G-10 to G-12, App. 617-18.

[35] *Id.*, G-11, App. 617.

[36] *Id.*

from the "engineered facility" was confined to the single conclusory sentence that: "The engineered facility for high level wastes will be designed to prevent any release of radioactive material either from natural phenomena or man-created accidents." [37] As to the remaining up-to-250,000 years of the wastes' toxicity, the reader was vouchsafed not even this degree of detail, as the Survey dismissed concern for it in the following two sentences:

> "It was planned to construct a federal repository in a salt mine for long-term geological storage of high-level wastes by the mid-1970's. However, subsequent events have deferred the site selection and construction of such a repository." [38]

4. ***Criticism of the Survey by Parties to the Rulemaking.***

Prior to the Hearing, the Environmental Protection Agency, the Sierra Club, respondent NRDC and others submitted detailed comments identifying specific defects in the analysis presented in the Survey.[39] Taken together, these detailed comments posed a basic challenge to the optimism of the Survey and the Commission's proposed rule.

The Sierra Club's comments stated clearly the gravamen of this challenge:

> "Many of the most important environmental risks and costs associated with the supporting fuel cycle for the nuclear power industry have been arbitrarily omitted from consideration or incompletely analyzed. Among the most prominent of these are plutonium

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[37] *Id.*, G-3, App. 612.

[38] *Id.*, G-10, App. 617.

[39] Though part of the record below, these and other comments critical of the Commission's Survey were mistakenly omitted from the Appendix. For the Court's convenience, respondents have reproduced these materials in an Appendix to this Brief, A-1 to A-51.

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handling and recycling, long-term storage of high-level wastes and thermal pollution.

* * * *

As a result of these shortcomings, the environmental costs of the fuel cycle are seriously underestimated in the Survey. Thus the conclusion, under consideration in the Commission's first alternative, that these costs are sufficiently small as not to affect the cost-benefit analysis for an LWR [light water reactor], is not tenable." [40]

NRDC's comments pointed to five major voids in the information provided by the Survey:

1. The Survey did not address the risks to human health and the environment resulting from extracting plutonium from spent fuel in reprocessing, including the risks of nuclear proliferation from successful diversion of extracted plutonium by foreign governments or terrorists.

2. Though admitting that the Commission had not developed a means for permanent disposal of high level radioactive wastes, the Survey failed to provide information relevant to evaluating the probability that some means of disposal would be developed to assure the isolation of these materials from the environment for the unprecedented time periods necessary, such as the circumstances surrounding, and the reasons for, the Commission's lack of success in developing waste repositories in bedded salt deposits.

3. The Survey failed to supply any details about the "near-surface engineered storage facility", making it difficult to accept the Commission's optimism regarding the possibility of storing wastes there for 100 years.

4. The Survey did not address at all the environmental implications of "decommissioning" a nuclear

[40] Sierra Club, "Comments on Environmental Survey of the Nuclear Fuel Cycle." (January 24, 1973) A-8, 9.

power plant at the end of its forty year life—the problems of permanently restricting public access to the site, or attempting to dismantle and dispose safely of the massive structure of the facility.

5. Throughout the Survey, the Commission repeatedly eliminated analysis of "rare or low probability events" with potentially catastrophic consequences by labelling them "incredible," rather than attempting to quantify them. In particular, NRDC commented, the risk of successful sabotage of a waste disposal or reprocessing facility could not be dismissed as "incredible." [41]

In a letter sent prior to the hearing, the Environmental Protection Agency also identified critical gaps in the Survey. It stated that neither of the proposed rules were "acceptable without modification," suggesting that in view of the large unexplored areas in the Survey, either proposed rule was acceptable only if its applicability were limited to two years, while the Commission worked to provide an adequate analysis of the fuel cycle. In particular, the EPA suggested that the "disposition of high-level waste" was "one specific area that should be further examined." It also criticized the Survey for its failure to provide information about the probability of accidents, and the vagueness of the Survey's discussion of the proposed "interim" storage facility for high level radioactive wastes.[42]

During the hearing, each participant was permitted to make oral presentation to the Hearing Board but at no time were any of the participants permitted to cross-examine or request discovery of the regulatory staff

[41] "Comments of the Natural Resources Defense Council, Inc., on the Environmental Survey of the Nuclear Fuel Cycle," (January 26, 1973) A-1 to A-7.

[42] Comments of the U.S. Environmental Protection Agency (submitted by letter of January 19, 1973), A-24 to A-34.

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on its Environmental Survey, the source of the facts utilized in preparing the Environmental Survey, the scientific and mathematical methodology utilized in deriving certain conclusions in the Survey, or the omission from the Survey of all alternatives to current AEC proposals for waste reprocessing and disposal. The questioning of the participants and the regulatory staff was conducted solely by the members of the Hearing Board, without the participants even being able to suggest questions.

5. ***Testimony of the Commission on Waste Disposal.***

To supplement the information provided in the Survey, the Commission offered two witnesses of its own. S. H. Smiley, Deputy Director for Fuels and Materials of the Commission's Directorate of Licensing, read a prepared statement summarizing the topics covered in the Survey. App. 757. Dr. Frank K. Pittman, Director of the Commission's Division of Waste Management and Transportation, presented a short statement regarding waste disposal. App. 776. His statement was devoted almost entirely to additional description of the environmental effects that the Commission projected from the normal operation of the temporary 100 year "engineered storage facility" for wastes envisioned in the Survey. Like the presentation in the Survey, Dr. Pittman's statement omitted reference to any actual experience relevant to assessing the possibility of constructing such a facility or the probability that the wastes could successfully be contained over such an extended period when constant human surveillance was required. While Dr. Pittman agreed that such a facility must be constructed to withstand all "credible" natural and manmade forces, he too offered no specification of what forces could be considered "credible." Similarly, although he opined that a permanent method of disposal for nuclear wastes would be demonstrated within a matter of 10 to 15 years, Dr. Pittman offered no information in support of this

position to add to the two sentence statement of the Survey. At the close of Dr. Pittman's statement, members of the Hearing Board put four questions to him.[43]

### 6. *Additional Concerns of the Parties and the Commission's Hearing Board.*

Although unable to propound questions to Dr. Pittman or Mr. Smiley, the Consolidated National Intervenors ("CNI") brought to the Commission's attention, through its counsel, Mr. Roisman, the omission of the critical questions identified in the pre-hearing submissions of NRDC and others that remained unaddressed in the statements of Mr. Smiley and Dr. Pittman and the questioning by the Board. App. 835-845.

Because of the limited ability of the participants to challenge the Environmental Survey, which was the sole document to be used as support for either of the two proposed alternatives, CNI and the Union of Concerned Scientists informed the Hearing Board that they intended to submit a comprehensive statement containing their comments and objections to the procedures used by the Commission and the insufficiency of the technical data contained in the Environmental Survey as issued by the regulatory staff. App. 844. Accordingly, they requested that a 30-day posthearing period be permitted for the filing of such a document. In a Further Notice of Hearing dated February 16, 1973, the Hearing Board declared that the oral hearing was to be regarded as concluded as of February 16, 1973, but that the record was to remain open until March 19, 1973, to permit the filing of any supplemental written statements which might be deemed appropriate in view of the hearing record. The Notice also allowed participants other than CNI and the Union of Concerned Scientists seven days within which

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[43] The transcript of this questioning, and Dr. Pittman's answers, consumes but five pages in the Appendix. App. 830-35.

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to review the supplemental filing and, if so, to request additional time therefor. Upon request, the Board granted several participants extensions of time until April 16, 1973, to respond to the supplementary comments. In its response the Commission's regulatory staff submitted a technical supplement entitled "Additional Information on Environmental Effects of the Uranium Fuel Cycle." App. 1058.

In the period following the hearing, additional detailed criticism of the analysis presented in the Environmental Survey and the testimony of the Commission's staff was submitted by a number of parties. On February 23, 1973, the Department of the Interior submitted a letter highly critical of the vagueness and generality of the information provided in the Survey. Noting that "The discussion of the effects [of the nuclear fuel cycle] on the environment are in most instances very general in this report," the Department suggested that "the November 1972 [Survey] should be significantly enlarged and modified if it is to fill the present need." In particular, the Department criticized the Survey for its failure "to describe the enormous potential for damage to the environment that is inherent . . . in the disposition of high-level radioactive wastes and purified plutonium," for its failure to consider the environmental effects of reprocessing spent fuel, and for its "assumption" that "chemical or radioactive wastes buried or held in retention ponds will not give rise to effluents and will not have environmental effects." "We do not," the letter added, "think that this assumption is generally acceptable." [11] Additional detailed critical comments were submitted by the Union of Concerned Scientists, App. 1067-1151, and jointly by the Union of Concerned Scientists/Consolidated National Intervenors, App. 1035-1057.

[11] Comments of the Department of Interior on the Environmental Survey of the Uranium Fuel Cycle (February 23, 1973), A-35 to A-42.

On July 6, 1973, the Hearing Board filed its "Report to the Commission by the Nuclear Fuel Cycle Hearing Board" setting forth its view of the issues that had been presented to the Hearing Board during the day and half of hearings. App. 364. In this report, the Hearing Board spotlighted the criticisms that had been raised by representatives of environmental/governmental critics concerning the inadequacy of the record to support the Commission's proposal to promulgate a rule regarding the environmental impact of the fuel cycle. It noted, *inter alia*, that

> "[T]he record of the hearing reveals that questions were raised as to the omission of any treatment in the Survey of the factors of safeguards against sabotage or possible diversion of nuclear materials, details of transportation, long-term environmental effects, selected aspects of mining and milling operations, details of various shipping operations, plutonium handling and others. A further example of alleged omissions from the Survey concerns the handling of plutonium isolated by the reprocessing plant which is also included in references to the omission of 'plutonium recycle' considerations."

App. 371. In light of these concerns, the Hearing Board asked

> "Whether, in light of the comments and questions raised in this record as to the present technical adequacy of the Survey, a substantial revision of the Environmental Survey should be prepared and issued by the Commission prior to the final adoption of regulations amending Part 20 of the Rules."

App. 372-3. It also asked

> "Whether more extensive analyses of the long-term environmental effects of, among others, waste storage and/or disposal are required to sustain the validity of the conclusions reached in the Survey."

App. 372.

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### 7. *The Commission Issues Its Rule.*

On April 16, 1974, the Commission promulgated a rule concerning the treatment of the environmental effects of the uranium fuel cycle in proceedings to license nuclear reactors. App. 385. Adopting "Alternative 2" of the earlier proposal, it took the position that the environmenntal impact of the fuel cycle was "relatively insignificant." App. 394. It also instructed its licensing boards that Table S-3 should thenceforth be inserted in the record of any licensing proceeding and should constitute the entire consideration of the environmental effects of the fuel cycle in any such proceeding, with no further examination or inquiry to be allowed.[45] In answer to the Hearing Board's question of whether, in light of the omissions identified by intervenors in their comments and questions, the Commission should prepare a "substantial revision" of the Environmental Survey, the Commission stated simply that it

> "believes that the Survey and hearing record provide an adequate data base for the regulation adopted."

App. 392. More specific questions raised in the Hearing Board's report were brushed aside with equally conclusory statements.

## B. The Decision of the Court of Appeals.

Respondents' challenge to the Commission's rulings in the rulemaking proceeding and the licensing of Vermont Yankee were heard and decided together by the U.S. Court of Appeals for the District of Columbia Circuit.

In examining the rulemaking proceeding, the court noted the narrow function to be discharged by a reviewing court. The court's function, it said, is not with the

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[45] 10 C.F.R. Part 51, § 51.20(e), App. 398.

wisdom of the decision, but rather with the rationality of the decision-making process. It must satisfy itself that the agency has addressed the major issues, and resolved them on the basis of all relevant factors. Under NEPA, the purpose of the Commission's rulemaking is to enlighten—to provide the public and other decisionmakers with information needed to assess whether a proposed action should be undertaken. To discharge this duty, the agency must give genuine consideration to the key issues, not just articulate its own view in conclusory terms. It must consider and acknowledge responsible scientific opinion in opposition to its own, and provide a reasoned explanation if it chooses to reject opposing views.

Turning to the record compiled by the Commission in its rulemaking, the court unanimously held that the Commission had failed to discharge these duties. Looking to the Survey, its backup documentation, and the testimony of Dr. Pittman in the hearing, it found that the agency had failed to give genuine consideration to the major issues concerning the environmental impact of waste disposal and the reprocessing of spent fuel.

Noting the extensive criticisms of the Survey submitted by the parties to the proceeding, the court held that the environmental parties had focused these issues sufficiently to require the Commission to come to grips with them. It also found, however, that the agency had failed in this duty, rejecting their contentions in a summary, unexplained manner.

In remanding the Commission's rulemaking, the court made clear that its complaint lay with the agency's failure to support its conclusion that the environmental effects of reprocessing and waste disposal were insignificant, rather than with the procedures followed, or the agency's explanation of its decision. While pointing to various procedures commonly used by agencies to pro-

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duce an adequate record in fact-oriented rulemaking proceedings, the court noted pointedly that even the same procedures, if "administered in a more sensitive manner," might result in a record adequate to support a decision.

### C. Events Since the Court's Decision: The President's Decision to Suspend Further Development of Plutonium Reprocessing.

Although the decision of the Court of Appeals held that the Commission had failed to give genuine consideration to some of the major public issues about the advisability of committing the Nation to a massive nuclear power industry, the Commission has continued to issue licenses for the construction and operation of nuclear plants with no more than a slight pause.

Immediately after the decision of the Court of Appeals, the Commission announced that it was temporarily suspending the further issuance of operating licenses or construction permits for nuclear power plants, in order to study the implications of the court's decision.[46] It also announced that it was reconvening the Licensing Board for Vermont Yankee, to determine whether the record in that proceeding should be reopened to take evidence on the issues involved in the court's decision.[47]

Exactly two months later, the Commission announced the commencement of a new rulemaking proceeding for the purpose of considering the adoption of an "interim" fuel cycle rule, to be used to license additional facilities pending a new proceeding to fashion a "final" fuel cycle rule.[48] This notice also announced that, pending the adoption of the "interim" rule, the Commission would

[46] 41 Fed. Reg. 34707 (August 16, 1976).

[47] *Id.*

[48] 41 Fed. Reg. 45849 (October 18, 1976).

resume licensing on the basis of a document containing a just-completed two-month staff analysis of the nuclear fuel cycle.[49] Subsequently the Commission promulgated its proposed "interim" rule, which is essentially the same as that overturned by the Court of Appeals.[50] Respondents have made it clear they regard these actions as contrary to the Court of Appeals' decision.[51] In the meantime, the Commission has undertaken a new generic rulemaking proceeding for the purpose of promulgating a replacement for the fuel cycle rule declared inadequate by the Court of Appeals.[52] The proposed final rule is identical to the interim rule, and thus differs little from the one disapproved in this case.

Shortly after the Commission announced the reconvening of the Licensing Board in Vermont Yankee, petitioners and the Commission sought and obtained a stay of the court's mandate.[53] In light of this action by the Court of Appeals, the Commission suspended its order reconvening the Licensing Board.[54] In sum, then, the Court of Appeals' decision has not had the dire consequences on the nuclear industry anticipated by petitioner Vermont Yankee in its petition for certiorari.[55]

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[49] 41 Fed. Reg. 49898 (Nov. 11, 1976).

[50] 42 Fed. Reg. 13803 (March 14, 1977).

[51] Comments of NRDC on Proposed Interim Fuel Cycle Rule (October 23, 1976); *NRDC* v. *N.R.C.*, Civ. No. 77-1448 (D.C. Cir.) (briefing stayed), filed May 13, 1977.

[52] 42 Fed. Reg. 26987 (May 26, 1977).

[53] Order of the Court of Appeals for the District of Columbia Circuit granting Vermont Yankee's *Motion for Stay Pending Application for a Writ of Certiorari*, October 8, 1976.

[54] *In re Vermont Yankee Nuclear Power Corporation* (Vermont Yankee Nuclear Power Station), CLI-76-18, NRCI 76-11470 (November 5, 1976).

[55] *See Petition of Vermont Yankee Nuclear Power Corporation for a Writ of Certiorari* (Sept. 21, 1976).

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However, the policy of the federal government with respect to the nuclear fuel cycle has been drastically altered. On April 7, 1977, the President of the United States announced "a major change in the United States domestic nuclear energy policies":

> "First of all, we will defer indefinitely the commercial reprocessing and recycling of the plutonium produced in U.S. nuclear power programs.[56]

In announcing his decision, the President based it on precisely the concerns expressed by the critics of the Commission's treatment of plutonium reprocessing in its rulemaking:

> "Last year during the Presidential campaign, both I and President Ford called for strict controls over fuels to prevent the proliferation, and further proliferation, of nuclear explosive capability.
>
> * * * *
>
> "We have seen recently India evolve an explosive device derived from a peaceful nuclear power plant, and we now feel that several other nations are on the verge of becoming nuclear explosive powers.
>
> "The United States is deeply concerned about the consequences of the uncontrolled spread of this nuclear weapon capability. We have no authority over other countries. But we believe these risks would be vastly increased by the further spread of reprocessing capabilities of the spent nuclear fuel from which explosives can be derived." [57]

## SUMMARY OFARGUMENT

In this case a federal agency has effectively ignored a substantial scientific controversy over an issue of major

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[56] "Remarks of the President on Nuclear Power Policy," the White House (April 7, 1977) (Reproduced at A-47 to A-51 of the Appendix to this Brief).

[57] *Id.*

technical and public significance. That issue involves potential threats to humanity and the environment for close to fifty times as long as recorded human history. The federal agency has chosen to avoid the issue on the basis of a supporting record consisting of testimony taken in a one and one-half day legislative-style hearing, a few general statements in a government document, and a one page table. The question is whether it may do so.

The legal issue posed is a simple one. The National Environmental Policy Act requires that a federal agency must prepare a detailed statement, assessing fully "any adverse environmental effects which cannot be avoided should the proposal be implemented." Section 102(2)(C)(ii), 42 U.S.C. § 4332(2)(C)(ii). After first denying any responsibility to consider the environmental effects of the waste products of nuclear power stations in connection with licensing them, the Nuclear Regulatory Commission reacted to the filing of this case by convening a rulemaking proceeding to seek comment on a single-page table, Table S-3, that was asserted to quantify all of the effects of the nuclear fule cycle.

In support of the facts alleged in Table S-3, the Commission offered a document, the Environmental Survey of the Nuclear Fuel Cycle, which discussed in conclusory terms the desiderata for a plant reprocessing spent fuel, and for a temporary (100 years) facility to store nuclear wastes pending the development of an as-yet undemonstrated means for isolating the wastes from the biosphere in perpetuity. After soliciting comment on its proposed rule, it held a one and one-half day hearing. At the hearing, the Commission presented two witnesses, one of whom addressed, in "vague, glowing" terms the Commission's "design concept" for the temporary waste storage facility. Neither discussed reprocessing of spent fuel. No discovery or cross-examination was allowed, despite the obvious significance of the issues under dis-

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cussion, and despite the fact that the Commission ordinarily afforded such procedures for probing far less significant environmental issues in adjudicatory power plant licensing proceedings, and has also commonly used them in "hybrid" rulemaking proceedings concerned with both safety and environmental issues.

Though hobbled by the procedural restrictions of the rulemaking, the respondents, along with other environmental organizations, individuals, and government agencies, identified a number of important issues slighted or omitted in the Commission's presentation which they said resulted in a gross understatement of the environmental consequences of fuel reprocessing and disposal of atomic wastes from nuclear power stations. One of the omissions they cited was the Commission's failure to consider the dangers of nuclear proliferation flowing from reprocessing plutonium from spent fuel. Yet this danger was later cited by the President of the United States as the reason why he ordered the suspension of further work on reprocessing by the United States.

On the basis of the cursory record developed through this proceeding, the Commission promulgated its proposed rule, with only the most minor modifications. Stating that it regarded the environmental impact of the nuclear fuel cycle as "essentially insignificant," it ordered that in all future proceedings to license nuclear power stations, Table S-3 should constitute the only evaluation of the environmental impact of the fuel cycle to be considered.

The Court of Appeals for the District of Columbia held that on this record the Commission had failed to discharge its duty under NEPA to evaluate and disclose fully the environmental consequences of its proposed actions, and had brushed aside the reasonable concerns expressed by respondents and others rather than considering them carefully and explaining its reasons

for any it rejected. Such rulemaking practice, it held, did not meet the test of reasoned decisionmaking under NEPA and the Administrative Procedure Act. It also held that the Commission had erred in granting an operating license to Vermont Yankee without any consideration of the environmental impact of reprocessing and disposing of its spent fuel.

The respondents submit that these decisions of the Court of Appeals were an unexceptionable exercise of the normal supervisory function of the federal courts in reviewing administrative rulemaking.

## ARGUMENT

### I.

### REJECTION OF THE FUEL CYCLE RULE WAS REQUIRED BY THE ADMINISTRATIVE PROCEDURE ACT AND THE NATIONAL ENVIRONMENTAL POLICY ACT.

In rejecting the Commission's proposed rule, the Court of Appeals exercised the most traditional reviewing powers of an appellate court overseeing the actions of an administrative agency. Examining the record of the Commission's rulemaking proceeding, the court found it riddled with vague, conclusory statements unsupported by reasoning or authority and outright omissions of obviously important issues, and marred by a refusal either to consider, or explain its failure to consider, such issues when they were brought to the agency's attention by other federal agencies, environmental organizations, and private citizens. Given the state of the record, the court had no choice but to hold that the Commission had failed to engage in the "reasoned decisionmaking" required of all administrative agencies. Judge Tamm, concurring, summarized the court's conclusion pungently.

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> "I further agree with the conclusion of the majority that it is impossible to determine from the record before us whether the Commission has fulfilled its statutory obligation under NEPA in adopting the S-3 Table, or whether it has uncritically adopted as its own the undocumented conclusions of a single witness that the waste storage issue is a "non-problem" with which the Commission need hardly concern itself at this time. Accordingly, the inadequacy of the record demands that we remand this case to the Commission in order to ensure that it has taken a hard look at the waste storage issue."

App. 78-79.

Both the law of administrative procedure and the National Environmental Policy Act prohibit an agency from promulgating a rule on the basis of a record so flawed as the one in this case. The law of administrative procedure governs any agency rulemaking; NEPA applies here because of the purpose of this particular rulemaking. The rule promulgated by the Commission was not itself an Environmental Impact Statement, but it was to be a portion of the Environmental Impact Statement for every future nuclear power plant to be licensed. Indeed, the Commission stated explicitly that it was to constitute the *entire* assessment of the environmental impact of the fuel cycle in each plant's Environmental Impact Statement.[58] Thus the Commission's proposal could not be approved unless it was found to meet the requirements of NEPA.

### A. The Law of Administrative Procedure Requires an Agency to Engage in Reasoned Decisionmaking.

Section 706(2)(A) of the Administrative Procedure Act, 5 U.S.C. § 706(2)(A), requires a reviewing court to set aside any action of an administrative agency that it finds to be ". . . arbitrary, capricious, and abuse of dis-

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[58] 10 C.F.R. Part 51, § 51.20(e), App. 398.

cretion . . . ." In decisions stretching over more than thirty years, this Court has held that this language requires rejection of administrative action that does not meet the standard of reasoned decisionmaking.

This Court has held that to determine whether this standard has been met, a reviewing court must examine the record and "consider whether the decision was based on a consideration of the relevant factors," *Citizens to Preserve Overton Park* v. *Volpe*, 401 U.S. 402, 416. Unless the record provides an "indication of the basis on which the agency exercised its expert discretion," *Burlington Truck Lines, Inc.* v. *U.S.*, 371 U.S. 156, 167, the agency's action cannot be sustained. *See also, S.E.C.* v. *Chenery*, 318 U.S. 80 (1943); *Camp* v. *Pitts*, 411 U.S. 138 (1973). Similarly, the agency must "articulate a rational connection between the facts found and the choice made." *Burlington Truck Lines, supra*, at 196.

In applying these principles, the lower federal courts have amplified their meaning in the context of rulemaking and adjudication alike. The duty to compile an adequate record includes an affirmative obligation to seek out relevant information, not merely to "act as an umpire blandly calling balls and strikes." *Scenic Hudson Preservation Conference* v. *F.P.C.*, 354 F.2d 608 (2d Cir. 1965), cert. denied, 384 U.S. 941; *Isbrantsen Co.* v. *U.S.*, 96 F.Supp. 883, 892 (S.D.N.Y. 1951). If a party calls its attention to an issue of importance, the agency's duty is to investigate—"when the issue fairly clamors for attention, even a gentle reminder speaks loud enough for the agency discharging its duty." *Marine Space Enclosures, Inc.* v. *F.M.C.*, 420 F.2d 580 (D.C. Cir. 1969). The duty is the greater when a citizens organization, with limited resources, identifies the issue. *Office of Communications of United Church of Christ* v. *F.C.C.*, 359 F.2d 994 (D.C. Cir. 1966).

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To assure the reasoned decisionmaking required by the Administrative Procedure Act, the courts have increasingly found it necessary to scrutinize carefully the record in administrative rulemaking, especially where questions of scientific and technical fact are crucial, as they are so often in environmental matters.

> A court does not depart from its proper functions when it undertakes a study of record, hopefully perceptive even as to the evidence on technical and specialized matters, for this enables the court to penetrate to the underlying decisions of the agency, to satisfy itself that the agency has exercised a reasoned discretion, with reasons that do not deviate from or ignore the ascertainable legislative intent.

*International Harvester Co.* v. *Ruckelshaus*, 478 F.2d 615, 648 (D.C. Cir. 1973), quoting *Greater Boston TV* v. *F.C.C.*, 444 F.2d 841, 850 (D.C. Cir. 1971), cert. denied, 403 U.S. 923, rehearing denied, 404 U.S. 877.

> "[T]he necessity to review agency decisions, if it is to be more than a meaningless exercise, requires enough steeping in technical matters to determine whether the agency 'has exercised a reasoned discretion.'"

*Portland Cement Association* v. *Ruckelshaus*, 486 F.2d 375 (D.C. Cir. 1973) (Leventhal, J.) cert. denied, 417 U.S. 921, rehearing denied, 423 U.S. 1025.

Thus the courts have, after searching examination of the record, set aside orders requiring new automobiles to be equipped with catalytic mufflers for the control of pollution, *International Harvester*, *supra*, on the grounds that the Administrator of the Environmental Protection Agency had failed to compile a record sufficient to demonstrate the availability of the technology within the time period allowed; regulations requiring new Portland cement factories to be equipped with stringent air pollution control equipment, *Portland Cement Association* v.

*Ruckelshaus, supra*, because the EPA Administrator had insufficiently addressed the issue of how much the technology would cost; regulations setting standards for discharges of water pollutants from chemical plants, *Hooker Chemical Co.* v. *Train*, 537 F.2d 639 (2d Cir. 1976), because they failed to consider the effects of cold weather on the technology to be used; and regulations prescribing measures for the control of automobile traffic to reduce air pollution caused by automobiles in Houston, *Texas* v. *EPA*, 499 F.2d 289 (5th Cir. 1974), and Boston, *South Terminal Co.* v. *EPA*, 504 F.2d 646 (1st Cir. 1974). As the Tenth Circuit recently held, reviewing an environmental regulation promulgated by informal rulemaking, "The grounds upon which an agency bases its decision must be clearly disclosed in, and sustained by, the record. The agency must make plain its course of inquiry, its analysis and its reasoning." *American Petroleum Institute* v. *EPA*, 540 F.2d 1023, 1029 (10th Cir. 1976).

### B. The National Environmental Policy Act Requires an Agency to Investigate Thoroughly and Disclose Fully the Environmental Consequences of Its Proposed Activities.

Under the National Environmental Policy Act, 42 U.S.C. §§ 4331 *et seq.*, any federal agency contemplating a major federal action which may affect the environment must prepare and make public a "detailed statement" analyzing the environmental impact of the proposed action. The Act is intended to be "action-forcing" [59]: to influence federal administrators to seek ways to lessen or eliminate the adverse effects on the environment from proposed projects or courses of action, Section 101(b), 42 U.S.C. § 4331(b). The Congress chose to require disclosure as the primary means to accomplish this pur-

[59] U.S. SEN. COMM. ON INTERIOR & INSULAR AFFAIRS, NATIONAL ENVIRONMENTAL POLICY ACT OF 1969. S. REP. NO. 91-296, 91st Cong., 1st Sess. (1969).

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pose. Section 102(2)(C), 42 U.S.C. § 4332(2)(C). Thus it required that each Environmental Impact Statement must analyze in detail

> "(i) the environmental impact of the proposed action,
>
> (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
>
> (iii) alternatives to the proposed action,
>
> (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
>
> (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action if implemented."

*Id.*

Requiring an agency to prepare an Environmental Impact Statement is designed to encourage more environmentally responsible agency behavior in two ways. First, it forces the agency to inform itself so that it acts "only following complete awareness . . . of the environmental consequences." *National Helium Corp.* v. *Morton*, 455 F.2d 650, 656 (10th Cir. 1971). And second, it provides the public, other agencies, the Congress and the courts with the information they need to exert their influence on the agency preparing the statement towards environmentally less damaging policies. Thus NEPA also "serves as an environmental full disclosure law, providing the information Congress thought the public should have concerning the particular environmental costs involved in the project." *Silva* v. *Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973); *Natural Resources Defense Council* v. *S.E.C.*, —— F.Supp. ——, 10 ERC 1026 (D.C.D.C. May 19, 1977), appeal pending. *See also*, *EDF* v. *Corps of Engineers*, 325 F.Supp. 749 (E.D. Ark. 1971), affirmed, 470 F.2d 289 (8th Cir. 1972).

In order to effectuate these purposes, this Court has stated that in reviewing the adequacy of an Environmental Impact Statement, the "role for a court is to insure the agency has taken a 'hard look' at the environmental consequences." *Kleppe* v. *Sierra Club*, 427 U.S. 390 (1976), 410 n. 21, citing *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827, 838 (D.C. Cir. 1972) (Leventhal, J.); *New York* v. *Kleppe*, 429 U.S. 1307, 1310-11 (1977) (circuit opinion of Justice Marshall, J.).

In order to insure that the agency has sought to inform itself fully, the courts look to the statement itself and its supporting materials for "an informed and adequately explained judgment," *Silva* v. *Lynn*, *supra*, at 1287, reflecting a "good faith effort to take into account the values NEPA seeks to safeguard." *Id.* at 1284. In preparing an Environmental Impact Statement the agency must "assemble the necessary information, perceive and weigh the alternatives, and articulate in writing the reasons for the choices made." *Brooks* v. *Volpe*, 350 F.Supp. 259, 274 (W.D. Wash. 1972). Thus NEPA "places a heavy burden on [the agency]. To enable a court to ascertain whether there has been genuine, not perfunctory, compliance with NEPA, the [agency] will be required to explicate fully its course of inquiry, its analysis, and its reasoning." *Ely* v. *Velde*, 451 F.2d 1130, 1139 (4th Cir. 1971).

If the agency fails to provide or explain the information supporting its conclusions, neither a reviewing court nor other decisionmakers can evaluate the proposed action as intended by Congress. A statement that is "too vague, too general and too conclusory", *Environmental Defense Fund* v. *Froehlke*, 473 F.2d 346, 348 (8th Cir. 1972), cannot be approved, nor can one "unsupported by empirical or experimental data, scientific authority, or explanatory information," *Natural Resources Defense Council* v. *Grant*, 355 F. Supp. 280, 287 (E.D.N.C.

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1973). Where technical issues are at stake, the agency may not resolve them simply by reference to its expertise, for "uncertainty must attend a court's approval of a statement based on an unknown 'record of expert views and opinions, the technological data and other relevant material . . .' on which the [agency] acted . . .", *Silva* v. *Lynn*, *supra*, at 1284, citing *Appalachian Power Co.* v. *E.P.A.*, 477 F.2d 485, 507 (4th Cir. 1973).

To further insure that an agency's proposed actions are exposed to the views of those who do not have a stake in the proposal, NEPA provides that the initiating agency shall "consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved," as well as others concerned with environmental standards. Section 102(2)(C) of NEPA, 42 U.S.C. § 4332(2)(C). This requirement is not merely formal, mandating "no more than the physical act of passing certain folders and papers, unopened to reviewing officials," as one court described the Commission's position in its earliest NEPA case, *Calvert Cliffs Coordinating Comm.* v. *Atomic Energy Commission*, 449 F.2d 1109, 1117 (D.C. Cir. 1971), cert. denied, 404 U.S. 942. Rather, the agency must take responsible criticism fully into account:

> "[W]here comments from responsible experts or sister agencies disclose new or conflicting data or opinions that cause concern that the agency may not have fully evaluated the project and its alternatives, these comments may not simply be ignored. There must be good faith, reasoned analysis in response."

*Silva* v. *Lynn*, *supra*, at 1285. *See also*, *Committee to Stop Route 7* v. *Volpe*, 503 F.2d 601 (2d Cir. 1973), *Committee for Nuclear Responsibility* v. *Seaborg*, 413 F. 2d 783 (D.C. Cir. 1972); *Akers* v. *Resor*, 339 F.Supp. 1375 (D.C.W.D. Tenn. 1972); *Simmans* v. *Grant*, 370 F.Supp. 5 (D.C.S.D. Tex. 1974).

### C. The Court of Appeals Correctly Held that the Commission Had Not Engaged in Reasoned Decision-making.

The decision below rests squarely on the court's entirely correct finding that the Commission failed to take the "good, hard look at the major issues" concerning the environmental hazards of the reprocessing and disposal of irradiated fuel from nuclear reactors. App. 46. This conclusion was surpassingly obvious. The Commission devoted only one and one-half days to hearings investigating the potential impact of these steps of the nuclear fuel cycle, even though they pose perhaps the major environmental questions about generating power from nuclear fission. In support of its assertion that the environmental effects of these steps in the fuel cycle were "relatively insignificant," it adduced only a few conclusory pages on each topic in its Environmental Survey, and the "vague, glowing" testimony on waste disposal of a single witness from its own staff.[60] Given the parlous state of the record, it is obvious why none of the petitioners disputes the court's conclusion.

The court's opinion traces carefully through the parsimonious offerings of the Commission, identifying clearly the failure to give any genuine consideration to the major issues involved. App. 50-66. Seeking support for the Commission's assertions, the court consulted the three

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[60] By contrast, major studies on the environmental impacts of reprocessing and waste disposal are now being undertaken by the Department of Energy, "Draft Generic Environmental Impact Statement, Management of Commercially-Generated Radioactive Wastes," and the Nuclear Regulatory Commission, GESMO, *supra*. These studies are all multi-year studies, whose depth and breadth dwarf the meager *Survey*. The procedures being used to develop the records far exceed those provided in the rulemaking involved here (*see* 41 Fed. Reg. 1133 (January 6, 1976) (GESMO); 41 Fed. Reg. 43446 (October 1, 1976) ("Management," *supra*)). The Commission continues to ignore these studies in its licensing proceedings for nuclear reactors.

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sources offered by the Commission: "the Environmental Survey, the back-up documentation to which it refers, and the oral and written testimony offered at the hearing." App. 51.

While noting that the Environmental Survey provided adequate information to support the Commission's conclusions for most aspects of the fuel cycle, this contrasted dramatically with the treatment of fuel reprocessing and waste disposal, where "support for the staff's conclusions was noticeably absent." App. 52. Turning to the hearing record, the court found that the Commission had supplemented the Survey's information about waste disposal with a 20-page statement by Dr. Pittman, which as the court said, "for the first time in public the 'design concepts' for a federal surface repository for retrievable storage of high-level waste"—essentially a warehouse in which sealed canisters containing cylinders of solidified nuclear wastes can be stored in water-filled basins recessed into the ground on a temporary basis (up to 100 years) until such time as a permanent waste disposal scheme is devised . . . ." App. 52-3. It went on to describe the vague and unsupported outline of this plan "now also postponed indefinitely," as it stated, App. 55, given by Dr. Pittman, pointing out his failure to discuss how the facility would be protected from terrorism, what measures might be taken to prevent a "meltdown," or how the Commission could assure that "adequate human surveillance and maintenance" could be assured over a period of a century. App. 60.

As to the ultimate disposition of these high-level wastes over the 250,000 year period of their toxicity, Dr. Pittman added no new information to supplement the two sentences devoted to this topic in the Survey. While he expressed optimism that the Commission would perfect means of indefinitely isolating wastes from the human environment by placing them in bedded salt, he said noth-

ing whatever to explain why, when the Commission had failed to demonstrate this method over a period of some 15 years, he expected such a drastic reversal of its fortunes.

Likewise, neither he nor the Commission's other witness, Mr. Smiley, uttered a single additional word to supplement the few conclusory sentences in the Environmental Survey concerning the environmental hazards of fuel reprocessing.

The court also found that when issues were raised before the Commission, it failed to take them seriously or explain why it had rejected them. Thus the court pointed to the fact that various of the intervenors had criticized the Commission for its reliance on discussions of what reprocessing and disposal facilities would have to do ("design concepts"), rather than actual information even where experience was available; that they had questioned the Commission's confidence that measures such as "engineered surface storage," relying on stable human institutions for a century or more, could protect the public adequately; and that they had expressed reasonable doubts that, after years of failure, the Commission would be able to develop a means for indefinite isolation of nuclear wastes. App. 62-4. It might also have mentioned the detailed critique of the Survey submitted in writing by NRDC and the Sierra Club, and the conclusions of both the Environmental Protection Agency and the Department of the Interior, in their written comments, that the information presented was inadequate to support the conclusions drawn in the Survey. *See* 14-16, 18-19, *supra*, and A-24 to A-42.

If this were not enough, the Commission's Hearing Board, as we have indicated previously, *see* 19, *supra*, App. 63-4, alerted the Commission to them in its Report on the rulemaking proceeding. But the Commission's only

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response was a few conclusory remarks in the notice accompanying its adoption of the rule. App. 364-5.

Summarizing its conclusion, the court found the Commission's conclusions unsupported in the record:

> "In substantial part, the materials uncritically relied on by the Commission in promulgating this rule consisted of extremely vague assurances by agency personnel that problems as yet unsolved will be solved. That is an insufficient record to sustain a rule limiting consideration of the environmental effects of nuclear waste disposal to the numerical values of Table S-3 . . . Not only were the generalities relied on in this case not subject to rigorous probing—in any form—but when apparently substantial criticisms were brought to the Commission's attention, it simply ignored them, or brushed them aside without answer. Without a thorough exploration of the problems involved in waste disposal, including past mistakes, and a forthright assessment of the uncertainties and differences in expert opinion, this type of agency action cannot pass muster as reasoned decisionmaking."

App. 66. There can be no question that this conclusion is correct.

Indeed, only one of the petitioners makes even a gesture toward contesting the court's conclusion. Petitioner Baltimore Gas & Electric urges that the court treated "cavalierly" the portion of the rulemaking record on reprocessing, because the court's opinion concentrates on explicating the record with respect to waste disposal. The petitioner urges that the record contains extensive materials related to the fuel cycle. Baltimore Gas and Electric Br. at 20. The fact is that the major document among those cited by the petitioners was the detailed attack on the vague assurances of the Survey in the Supplementary Comments of the Union of Concerned Scientists, App.

1067, 1108-1150, which was supported by the earlier comments of respondent, the Sierra Club, the Environmental Protection Agency, the Department of the Interior, and others. And the critical point is that the Commission *did not* base its conclusions on the items petitioners refers to: indeed, the Commission gave *no* indication of the basis for the asserted insignificance of the environmental hazards of reprocessing, except to refer to the vague generalities of the Survey. App. 391.

## II.

### THE COURT OF APPEALS DID NOT DIRECT THE COMMISSION TO ADOPT ADDITIONAL PROCEDURES, ALTHOUGH IN CASES SUCH AS THIS, A COURT MAY REQUIRE ADDITIONAL PROCEDURES TO ASSURE THE DEVELOPMENT OF AN ADEQUATE RECORD.

Unable to assail the court's conclusion as to the record, the petitioners turn their fire on a straw man. They urge that the court required the Commission to adopt procedures beyond the minimum required by the Administrative Procedure Act for rulemaking, then seek to demonstrate that this was beyond the court's power. Vermont Yankee Br. at 30-38; Baltimore Gas and Electric Br. at 22-34; Government Br. at 38-46.

The government's attempt to pursue this issue is particularly curious. In its present brief it states that:

> "It is open to dispute whether the decision of the court of appeals in *Vermont Yankee* is based on the conclusion that the Commission's rulemaking *procedures* were inadequate, or whether it simply concluded that the *record* upon which the Commission relied in promulgating its rule was inadequate." [emphasis in original]

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Government's Br. at 36. It agrees that if the latter interpretation is correct, "no significant question for review by the Court would be presented," *Id.*, but then proceeds to a long attack on the decision as if the decision were based on deficiencies in the Commission's procedure.

In its response to the petition for certiorari in this case, however, the United States took a far less equivocal view:

> "The United States *believes* that the court in *Vermont Yankee* held unanimously that the record in the particular rulemaking proceeding at issue was inadequate to support the rule promulgated." [emphasis supplied]

Government's Br. in reply to the Petitions for *Certiorari* in Nos. 76-419, 76-528, 76-548, and 76-745 at 9. Only the Nuclear Regulatory Commission argued that the Court of Appeals' decision involved whether the Commission had used proper procedure in the rulemaking, *Id.*, at 5-9. Thus the position now urged by the Solicitor General is in fact espoused only by the Commission itself.

For the Commission to advocate this position is disingenuous in the extreme. In the administrative proceedings responding to the Court of Appeals' decision,[61] the Commission has consistently argued that the court's decision was based entirely on the deficiencies it found in the record, steadfastly denying NRDC's requests for additional procedures to aid in the development of a new record regarding the environmental effects of waste reprocessing and disposal.

> "[T]he court found that the rule was inadequately supported in the record insofar as it treated two particular aspects of the fuel cycle—the impacts from reprocessing of spent fuel and the impacts from radioactive waste management [disposal].

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[61] *See* 22-24, *supra*.

41 *Fed. Reg.* 45849 (October 18, 1976) (announcing the Commission's intention to undertake licensing of reactors pending the promulgation of an "interim" fuel cycle rule). More recently, opening a rulemaking to develop a new rule to supplant the one overturned by the Court of Appeals, the Commission stated:

> "The original procedures proved adequate for the development and illumination of a wide range of fuel cycle impact issues . . . . True, the record was held inadequate on the two matters at issue here, but these issues are of the same character as the other issues regarding which the record did prove adequate . . . .
>
> . . . The court here indicated that the procedures previously employed would suffice, and indeed did for other issues . . . .
>
> • • • •
>
> Accordingly, notice is hereby given that the rules for the conduct of the reopened hearing and the authorities and responsibilities of the Hearing Board will be the same as originally applied in this matter (38 Fed. Reg. 49, January 3, 1973) except that specific provision is hereby made for the Hearing Board to entertain suggestions from participants as to questions which the Board should ask of witnesses for other participants."

42 *Fed. Reg.* 26987, at 26988-89 (May 26, 1977).[62]

The positions of the petitioners vary somewhat, but they sound a like theme. All three accuse the court below of attempting to require the Commission to adopt procedures in excess of the minima specified for informal rulemaking under the Administrative Procedure Act. Petitioner Vermont Yankee then expounds the expansive theory that in reviewing an administrative rulemaking,

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[62] Reprinted in Supplemental Appendix to the Petition for Certiorari in No. 76-419 at SA-20 to 24.

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a court may never require an agency to adopt any additional procedures beyond the minimum notice and comment specified in 5 U.S.C. § 553. Vermont Yankee Br. 35. Petitioner Baltimore Gas & Electric and the government, though somewhat less expansive, propose to lay a heavy burden on those who seek greater opportunity to make their views known. Baltimore Gas & Electric Br. 28, Government's Br. 46.

### A. The Court of Appeals Did Not Direct the Commission to Provide Any Additional Procedures.

The short answer to all these arguments is that the court below did not rule as alleged by the petitioners. At the outset of its analysis of the record, the court stated its view that

> "Absent extraordinary circumstances, it is not proper for a reviewing court to prescribe the procedural format which an agency must use to explore a given set of issues."

App. 45. And in announcing its conclusion, the court stated flatly:

> "We do not presume to intrude on the agency's province by dictating to it which, if any of these devices it must adopt to flesh out the record. It may be that no combination of the procedures mentioned above will prove adequate . . . . On the other hand, the procedures the agency adopted in this case, if administered in a more sensitive, deliberate manner, might suffice."

App. 67.

More telling, the court explicitly ruled against the contention of the intervenors that they were entitled to discovery and cross-examination of witnesses in the rulemaking proceeding. App. 43-45. *See* Brief of Natural Resources Defense Council and Consolidated National Intervenors in the rulemaking case below (No. 74-1586 before the Court of Appeals), at 11-21.

It is true that the court spoke of the procedures the Commission used. But petitioners mislead this Court in suggesting that an abstract concern for procedure formed the basis for the court's decision. To the contrary, the court's concern with the procedures used was with their failure to produce any "rigorous probing" of the issues before the agency. App. 66. It was concerned with whether the procedures chosen, and the spirit in which they were administered, had provided an opportunity for the kind of give and take between the Commission and its critics ("ventilation") that would assure the Commission had come to grips with the fundamental differences of opinion and resolved them in a reasoned way. Concern for reasoned governmental behavior, not for procedure, motivates a court that bases its decision on, *inter alia*, the fact that "when apparently substantial criticisms were brought to the Commission's attention, it simply ignored them or brushed them aside without answer." App. 66.

### B. Neither NEPA Nor the Administrative Procedure Act Provides Administrative Agencies Untrammelled Discretion To Constrict Their Rulemaking Procedures.

Despite the fact that the issue is not presented in this case, the petitioners urge this Court to rule to restrict drastically the Courts of Appeals' authority to oversee the actions of administrative agencies. The sum and substance of the petitioners' position is that, even if the purpose of an administrative proceeding is to develop and explicate a wholly factual question in order to discharge the duty to inform the public and other decision-makers imposed by NEPA, the Administrative Procedure Act provides the agency essentially unreviewable discretion to restrict the procedures used to illuminate the questions to the minimum notice and comment. Though this legal question is not presented in this case, the petitioners' contention is flatly incorrect as a matter of law.

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### 1. *Agencies May be Required By NEPA to Provide Procedures Beyond The Minima Specified in 5 U.S.C. § 553 When Investigating Factual Issues Through Rulemaking.*

As the court pointed out, App. 48, the Commission's rulemaking was undertaken in the context of NEPA, not just the Administrative Procedure Act. NEPA's central purpose is the development and dissemination of factual information "to the fullest extent possible" Section 102, 42 U.S.C. § 4332; *Flint Ridge Development Corp.* v. *Scenic Rivers Association*, 96 S.Ct. 2430, (1976); *Silva* v. *Lynn, supra; Environmental Defense Fund* v. *Corps of Engineers, supra.* To this end, the courts have correctly held, that an agency's discretion to limit its investigation is tightly confined. *E.g., Hanly* v. *Mitchell*, 460 F.2d 640 (2d Cir. 1972), cert. denied *sub nom. Hanly* v. *Kleindienst*, 409 U.S. 990; *Flint Ridge Development Corp.* v. *Scenic Rivers Association, supra, NRDC* v. *Morton, supra; Scientists' Institute for Public Information* v. *A.E.C.*, 481 F.2d 1079, 1088 (D.C. Cir. 1973).[63] In the words of one commentator, "there is no question that NEPA accentuates the Overton Park tendency to require a 'hard look' by the courts at agency actions affecting the environment." [64] By contrast, the purpose of the Administrative Procedure Act is narrower

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[63] The entire contribution of the Commission's rulemaking here to the Environmental Impact Statements for future nuclear power plants was a one-page table of figures, "Table S-3," purporting to quantify the environmental effects of the nuclear fuel cycle. Promulgation of the Final rule respecting the "Environmental Effects of the Nuclear Fuel Cycle," 39 Fed. Reg. 14188 (April 22, 1974), App. 385, 400, accompanied by two paragraphs specifying that Table S-3 was to be included in the Environmental Impact Statement for any future nuclear power plant, and was to constitute the entire consideration given the fuel cycle in any such Statement, 10 C.F.R. § 51.20(e), App. 398.

[64] RODGERS, ENVIRONMENTAL LAW, West Hornbook Series 716-17 (1977), citing Leventhal, *Environmental Decisionmaking and the Role of the Courts*, 122 U.PA. L. REV. 509, 512 (1975).

—to assure that the Agency's action lies within the broad range of discretion granted by Congress. *U.S.* v. *Allegheny Ludlum Steel Corp.*, 406 U.S. 742 (1972); *U.S.* v. *Florida East Coast Railway Co.*, 410 U.S. 224 (1973).

Thus, petitioner Baltimore Gas & Electric is wrong on the law as well as the facts when it suggests that the environmental organizations failed to make a "showing of substantial justification" of the need for cross-examination and discovery in the rulemaking proceeding. Baltimore Gas & Electric Br. at 28-34. Putting aside whether the petitioner has accurately stated the law under the Administrative Procedure Act,[65] it is by no means self-evident that any such showing is necessary in an essentially fact-finding proceeding under NEPA.[66]

### 2. *The Administrative Procedure Act Requires More Than the Minimum Procedures Specified in 5 U.S.C. § 553, Where As Here, the Agency Has Routinely Provided Such Procedures in the Past.*

Agencies are not free to alter their procedures on a whim, grossly constricting parties' procedural rights when it deems them an impediment or embarrassment to implementing its own views. The government con-

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[65] The court below explicitly held that the environmental organizations had adequately alerted the Commission of their concerns under the standards of the Administrative Procedure Act over the same claim by Baltimore Gas & Electric, App. 44. Citing specific references in the record, it held that the environmental organizations had "sufficiently focus[ed] the agency's attention on Dr. Pittman's testimony as in the category of 'soft and sensitive subjects and witnesses,'" *citing International Harvester* v. *Ruckelshaus*, *supra*. In addition to the materials cited by the court, as noted previously, comments including specific criticisms of the Commission's positions on reprocessing and waste disposal were submitted prior to the hearing by NRDC, the Sierra Club, and the Environmental Protection Agency, and after the hearing by the Department of the Interior and the Union of Concerned Scientists. *See* cases discussed at 30, *supra*.

[66] Leventhal, *supra*.

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cedes that Constitutional due process may require a court to specify additional procedures beyond the minima prescribed by the Administrative Procedure Act where there are

> "unjustified departures from settled agency practice, such as an agency's refusal to employ for a particular rulemaking more extensive procedures that the agency has routinely afforded."

Government's Br. at 47. *See Marine Space Enclosures* v. *F.M.C., supra; see also* dissent of *Burger, J.*, in *American Airlines* v. *C.A.B.*, 359 F.2d 624 (D.C. Cir. 1966). Though the government refuses to recognize it,[67] this is precisely the situation in this case.

Under the Commission's regulations, 10 C.F.R. § 51.20 (e), an Environmental Impact Statement for any nuclear power plant is subject to the same adjudicatory hearing afforded for any issue respecting the construction or operation of the plant. These regulations provide that any intervenor in a licensing proceeding shall be afforded the full panoply of adjudicatory rights under Sections 7 and 8 of the Administrative Procedure Act, 5 U.S.C. §§ 556-7.

Pursuant to the ruling by the Commission at the behest of NRDC, certain of the generic environmental issues related to the nuclear fuel cycle were required to be considered in the Vermont Yankee licensing proceeding. *In the Matter of Vermont Yankee Nuclear Power Corporation (Vermont Yankee Nuclear Power Station), ALAB-56*, App. 112, 115. However, consideration of the environmental impact of reprocessing spent fuel and waste disposal were removed from the normal process to

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[67] The government erroneously alleges, without reference to the record or other Commission proceeding, that "the Commission's manner of proceeding was consistent with its previous practice." Government's Br. at 47.

be considered only in the far less searching manner afforded in the Commission's rulemaking proceeding.[68]

Thus, the Commission singled out these issues, widely regarded as the most important and problematical ones related to nuclear power, for treatment under a procedure markedly less likely to result in "rigorous probing" than the procedures normally used to investigate environmental and nuclear safety questions, allowing the Commission to avoid confronting the criticisms of the environmental organizations and resolve them in a reasoned manner. The stated reason for this restriction, the generic nature of the issues surrounding the fuel cycle, 37 Fed. Reg. 24191, 24192 (November 15, 1972) App. 352, 355, was suspect on its face, for the Commission had already ruled that such equally "generic issues as the transportation of high and low level wastes from Vermont Yankee were to continue to be addressed in the normal adjudicatory fashion."

It is certainly true that the Commission has in the past chosen to consider both environmental and safety issues that would ordinarily be addressed in adjudicatory licensing proceedings through "generic" rulemaking, a practice with which the lower court did not take issue. But in those proceedings the Commission has provided for far greater participation by parties through procedures well in excess of those provided here, including in some instances the cross-examination which was denied

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[68] In promulgating its fuel cycle rule, the Commission ruled that once Table S-3 was inserted into the Environmental Impact Statement for a specific power plant, no further examination of the fuel cycle issues addressed there would be allowed in the licensing proceeding. 39 Fed. Reg. 14188 (April 22, 1974), amending 10 C.F.R. Part 50, Appendix D, App. 385, 398.

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the environmental organizations in the fuel cycle rulemaking.[69]

### 3. *A Court May Require More Than the Minimum Procedures of 5 U.S.C. § 553 When an Agency's Proposed Rule Addresses Complex or Technical Factual Issues, or Issues of Great Public Import.*

Even where agencies have not departed from prior practices, a reviewing court is not so powerless to oversee their procedures under the Administrative Procedure Act as the petitioners suggest. In their briefs, they take the extreme positions that the agency's discretion to limit participants to notice and comment procedures is unreviewable, Vermont Yankee Br. at 35, or reviewable only in "extraordinary circumstances," Government's Br. at 47, or upon a showing of "substantial justification," Baltimore Gas & Electric Br. at 28. With these assertions, they ask this Court to ignore the intent of the drafters of the Administrative Procedure Act, and to repudiate on the most significant and widely hailed developments in the law of administrative procedures—the development of what has been called "hybrid rulemaking."

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[69] For example, the Commission has allowed parties to undertake cross-examination in rulemaking proceedings regarding the "Emergency Core Cooling Systems" of nuclear power plants, 37 Fed. Reg. 2881 (Jan. 8, 1972); whether the Commission's regulations required emissions of radioactive effluents from the normal operation of nuclear power plants to be "As Low As Practicable," 37 Fed. Reg. 287 (Jan. 8, 1972), and provided opportunity for cross-examination in preparation of a "Generic Environmental Statement for the Mixed Oxide Fuel Cycle" ("GESMO") (reprocessing of spent fuel), 41 Fed. Reg. 1133 (Jan. 6, 1976). Perhaps the most telling, in the Commission's rulemaking pursuant to the remand of this case, undertaken to compile a new record concerning waste disposal and reprocessing, the Commission has provided for procedures not accorded in the original fuel cycle rulemaking under review here. 42 Fed. Reg. 26987, 26988-89 (May 26, 1977), *see* 22-24, *supra*.

The government recognizes,[70] though it fails to comprehend,[71] that the framers of the Administrative Procedure Act intended that notice and comment procedures would constitute the *minimum* procedures that should accompany agency rulemaking. The Senate Report[72] on Section 4(b) of the Administrative Procedure Act (now 5 U.S.C. § 553(c)) makes this point clearly:

> "This subsection states . . . the minimum requirements of public rulemaking procedure short of statutory hearing. Under it agencies might in addition confer with industry advisory committees, consult organizations, hold informal "hearings," and the like . . . . *Matters of great import, or those where the public submission of facts will be either useful to the agency or a protection to the public, should naturally be accorded more elaborate public procedures.*" [emphasis supplied]

Senate Report, *supra*, at 14-15.

The import of this statement has been increasingly recognized in recent years, as administrative agencies have been delegated the duty to undertake rulemaking in complicated technical matters of great import to society. While courts have upheld simple notice and comment rulemaking to resolve such relatively technically simple policy issues as safety standards for lighting boat trailers, *Boating Industry Association* v. *Boyd*, 409 F.2d 408 (7th Cir. 1969), and the mandatory retirement age for pilots, *O'Donnell* v. *Shaffer*, 491 F.2d 59 (D.C. Cir. 1974), they have increasingly hesitated to endorse such simple procedures when issues of major import are at stake, especially if they find that the issues involved have been inadequately explored, *e.g.*, *Mobil Oil Co.* v.

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[70] Government's Br. at 43.

[71] *Id.*, at 43, 47.

[72] S. REP. No. 752, 79th Cong., 1st Sess. 14-15 (1945).

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*F.P.C.*, 483 F.2d 1238, (D.C. Cir. 1973); *Walter Holm & Co.* v. *Hardin*, 449 F.2d 1009 (D.C. Cir. 1971); *Buckeye Power Co.* v. *EPA*, 481 F.2d 162 (6th Cir. 1973); *Appalachian Power Co.* v. *EPA*, *supra.*

In endorsement of this trend, the Administrative Conference of the United States adopted, in June, 1976, *Recommendation 76-3, Procedures in Addition to Notice and Opportunity for Comment in Informal Rulemaking*, "specifying for agency consideration certain procedures going beyond notice-and-comment, and . . . describing some of the 'circumstances of particular proceedings' that should move agencies to consider such additional procedures." ADMINISTRATIVE CONFERENCE OF THE UNITED STATES, 1976 REPORT (March, 1977).[73]

Additional procedures[74] were especially recommended when

> "(1) the scientific or other data relevant to the proposed rule are complex;
>
> • • • •

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[73] The full text of the Recommendation, as adopted, is at page A-43 of the Appendix to this Brief.

[74] The additional procedures recommended were the following:

— Advance notice of rulemaking when the issues raised by the rulemaking were anticipated to be unusually complex;

— Providing for two cycles of notice and comment when comments filed in the proceeding present new and important issues or serious conflicts of law;

— Incorporating in the notice a description of the data on which the agency relies;

— Providing an explanation of the tests and other procedures followed by the agency and the significance the agency attached to them;

— Holding conferences open to the public *with an opportunity for all interested groups to question one another*;

— Hearing argument and other presentations, *with questioning, including cross-examination or questions submitted by interested persons.* [emphasis supplied]
Recommendation 76-3, *supra.*

> (3) the costs that errors in the rule may impose, including health, welfare and environmental losses imposed on the public and pecuniary expenses imposed on the affected industries and consumers of their products, are significant."

*Recommendation 76-3, supra.*

The approach advocated by the Administrative Conference has also been endorsed by the Committee on Governmental Affairs of the United States Senate, in a multivolume STUDY OF FEDERAL REGULATION.[75] Quoting with approval from the decision of the Court of Appeals in this case,[76] it proposed that agencies adopt a model "hybrid" rulemaking procedure designed to assure full ventilation of important policy issues involving complex factual questions."[77]

Likewise, commentators on administrative procedure have recommended additional procedures beyond the minima provided by the Administrative Procedure Act in complex, technical areas, in order to assure the development of an adequate record:

> "[I]n at least a significant number of instances agencies should thus exercise their discretion to fashion hybrid or conglomerate procedural devices which would utilize those characteristics of both adjudication and rulemaking that are most appropriate in

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[75] U.S. SEN. COMM. ON GOVERNMENTAL AFFAIRS, STUDY OF FEDERAL REGULATIONS, prepared pursuant to S. Res. 71, 95th Cong., 1st Sess. (July, 1977).

[76] The study added:

> "Whether the label rulemaking or adjudication is attached to the procedure is not so important as whether the procedure provides a full opportunity for all interested persons to make their views known in a timely fashion."

*Id.*, Vol. 4, at 37.

[77] *Id.*, at 39-45.

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> light of the circumstances and issues of the particular case. It is submitted, further, that, like any other exercise of agency discretion, an agency's decision whether to employ procedural devices not uniformly required by statute is subject to judicial review for abuse of discretion and should be set aside when such abuse is found.[78]

Perhaps especially significant, those who have studied the process of informal rulemaking in technical areas at first hand—as officials of agencies engaged in such rulemaking—have voiced their support for this development in the law of administrative procedure.[79]

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[78] Bruce McAdoo Clagett, *Informal Action—Adjudication—Rulemaking: Some Recent Developments in Federal Administrative Law*, 71 DUKE L.J. 51 (1971). Davis, ADMINISTRATIVE LAW OF THE SEVENTIES, SUPPLEMENT TO ADMINISTRATIVE LAW TREATISE, Sec. 6.04-1 (1976). *See also* Robert W. Hamilton, *Procedures for the Adoption of Rules of General Applicability: the Need for Procedural Innovation in Administrative Rulemaking*, 60 CALIF. L. REV. 1276 (1972); Barry B. Boyer, *Alternatives to Administrative Trial-Type Hearings for Resolving Complex Scientific, Economic and Social Issues*, 71 MICH. L. REV. 111 (1972); Richard B. Stewart, *The Development of Administrative and Quasi-Constitutional Law in Judicial Review of Environmental Decisionmaking: Lessons from the Clean Air Act*, 62 IOWA L. REV. 713 (1977).

At least two students of the Commission's rulemaking have specifically urged the need for cross-examination, on grounds of:

> (1) The need for questioning to enable parties to discern the accuracy of evidence when factual matters are disputed,
>
> (2) The public's perception of the Commission's fairness, upon which the Commission's credibility depends, and
>
> (3) The need for accuracy in the initial rule to avoid later challenges to it, so that the rulemaking process might live up to the promise of efficiency which caused the agency to choose rulemaking originally.

Comment, *Generic Rulemaking*, 61 U. VA. L. REV. 390 (1971); Johnston, *AEC Rulemaking and Public Participation*, 62 GEO. L.J. 1737 (1974).

[79] William F. Pedersen, Jr., *"Formal Records and Informal Rulemaking,"* 85 YALE L.J. 38 (1975).

Indeed, except in the Commission's fuel cycle rulemaking, "hybrid rulemaking" has virtually become the norm in major rulemaking proceedings across the federal government. In September, 1976, the Administrative Conference sent a letter to 35 federal agencies in order to assess their compliance with its Recommendation 76-3. As of July, 1977, responses had been received from 22 agencies. These responses indicate that the procedures suggested by the Conference are in many agencies already a routine part of their operating procedure [50] and have

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[50] The procedures suggested by the Administrative Conference in Recommendation 76-3 have been adopted by numerous federal agencies. The following is a summary of the instances reported to the Administrative Conference. Information respecting the Environmental Protection Agency, Consumer Product Safety Commission, and the Federal Energy Administration was not available, although these agencies have also used "hybrid" procedures.

(a) Advance notice of proposed rulemaking has been used by the Civil Aeronautics Board ("CAB") (*see* 37 Fed. Reg. 15518 (Aug. 3, 1972), 40 Fed. Reg. 24740 (June 10, 1975)); the Commodity Futures Trading Commission ("CFTC"); the Civil Service Commission ("CSC"); the Federal Communications Commission ("FCC"); the Federal Reserve Board ("FRB"); the Department of Health, Education and Welfare ("HEW"); the Department of Labor ("Labor"); and the Small Business Administration ("SBA") (30 Fed. Reg. 39478 (Nov. 7, 1974)).

(b) Two or more cycles of rulemaking have been instituted by the CAB (41 Fed. Reg. 13616 (March 31, 1976)); CSC; CFRC; FCC; the Federal Home Loan Bank Board ("FHLBB"); FRB; FTC; (Two cycles of rulemaking are *always* used in FTC and SBA, (*e.g.*, 39 Fed. Reg. 22802 (August 24, 1973); and 41 Fed. Reg. 24915 (June 21, 1976)).

(c) Public conferences or question and answer sessions have been utilized by CAB (41 Fed. Reg. 18704 (May 6, 1976); CSC; CFTC (questions from the public are presented to witnesses by the Commissioners); FCC; FHLB; FRB; FTC (Public hearings are held on *all* rules); HEW (41 Fed. Reg. 56966 (December 30, 1976) on the Education of Handicapped Children Act of 1975 over 20 public meetings were held with about 2200 people attending); ICC (Ex. Parte No. Mc-19, Ex Parte No. Mc-77); Labor, SBA (36 Fed. Reg. 25052 (Dec. 28, 1971), 40 Fed. Reg. 25831 (June 19, 1975), 41 Fed. Reg. 37817 (Sept. 8, 1976)); and the Department of State ("State").

[Footnote continued on page 55]

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[80] [Continued]

(d) Oral argument is a procedure employed by CAB (37 Fed. Reg. 6322 (March 28, 1972); CSC; EEOC; FCC; FRB; HEW; ICC; ITC; Labor; SBA; and State.

(e) Many agencies, in their attempt to open up the rulemaking process to the public, have added other procedures, especially the dissemination of rulemaking information to a wide range of parties rather than relying on Federal Register notice alone. *E.g.*, HEW; Labor; CSC; CAB.

(f) The Administrative Conference' survey asked agencies "what steps they had taken to ensure that interested persons are given an opportunity to indicate issues of specific fact they contest as to which cross-examination is appropriate." Most of the responding agencies found that cross-examination was not appropriate to the type of general policy rulemaking they undertake, but several suggested that they have either provided such an opportunity (HEW, ICC, FTC) or would do so in the future (ITC, CFTC, CSC).

(g) Agencies were also asked by the Administrative Conference if they had used cross-examination in notice-and-comment rulemaking proceedings. They replied as follows. The CAB had plans to use cross-examination in a proposed rulemaking proceeding (40 Fed. Reg. 37048-50 (Aug. 25, 1975)); the FCC allowed cross-examination; the FRC allows cross-examination on "disputed issues of fact that are material and necessary to resolve;" the FMC calls a full evidentiary hearing whenever the Commission decides that a proposed rule requires the taking of evidence; the ICC allows cross-examination and the SBA permits questioning but questions are to be presented through the hearing Chairman (40 Fed. Reg. 25831 (June 19, 1975), 40 Fed. Reg. 32142 (July 31, 1975)).

(h) Those agencies which do not use techniques such as cross-examination in their proceedings indicated to the Administrative Conference that cross-examination would be useful in circumstances which have not arisen before their particular agency. For example, the Veterans Administration noted that the failure of the VA to provide cross-examination in rulemaking is because it is confined to mainly technical and administrative implementation of the law. Letter of November 11, 1976, from Richard L. Roudebush, Administrator, to Administrative Conference.

This information was compiled from the responses to the Administrative Conference's questionnaire at its office, 2120 "L" Street, N.W., Washington, D.C. 20037.

been found to be useful in informal rulemaking in factually complicated settings."[81]

In summary, the petitioners in this case have asked the court to adopt a strained interpretation of the decision of the Court of Appeals—ignoring the manifold and obvious deficiencies in the record outlined clearly in the lower court's opinion, and ignoring the fact that the court specifically refused a request from the environmental organizations to rule that the agency must accord them procedures in addition to those employed in the rulemaking. They thus ask to destroy important developments in the judicial implementation of the Administrative Procedure Act to oversee the increasingly ubiquitous activities of federal administrative agencies. As we have indicated previously the opinion of the Court of Appeals is grounded solidly on the inadequacies of the record before the Commission. We submit that neither law nor policy justifies the kind of contortion of the lower court's holding proposed by the petitioners.

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[81] According to responses to the Administrative Conference's questionnaire, the agencies employing cross-examination in rulemaking have invoked it "to resolve decisionally significant factual dispute which cannot be effectively resolved in other ways" (FCC—letter of October 27, 1976, from Richard E. Wiley, Chairman, to the Administrative Conference); "at [oral hearings at] which complex factual issues will require detailed examination" (ICC—letter of November 2, 1976, from George M. Stafford, Chairman, to the Administrative Conference); when "issues [are] complex, public interest [is] great, and the public views expressed [are] widely differing" (SBA—letter of September 17, 1976, from Mitchell P. Kobelinski, Administrator, to Administrative Conference; and when "recognizing the desirability of subjecting the empirical studies expected to be developed to cross-examination" (CAB—letter of October 21, 1976, from Lee R. West, Member, to the Administrative Conference). *Id.*

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## III.

## VERMONT YANKEE COULD NOT BE LICENSED WITHOUT CONSIDERING THE ENVIRONMENTAL IMPACT OF REPROCESSING AND DISPOSING OF ITS WASTES.

While it scrupulously took no position as to the kind of proceeding needed to assure the full consideration of waste disposal, fuel reprocessing, and other elements of the nuclear fuel cycle, the Court of Appeals held flatly that NEPA forbid the Commission from licensing a nuclear plant without *any* consideration of these issues.[82] Thus the operating license issued to Vermont Yankee was remanded to the Commission to await the outcome of the renewed rulemaking proceeding with respect to these issues. App. 40.

This ruling was so obviously correct that it is disputed by no one before this Court save Vermont Yankee. (The

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[82] As a result of the twists and turns of the Commission's policy with respect to considering the environmental impact of the nuclear fuel cycle, these issues had been considered with respect to Vermont Yankee in neither the licensing proceeding nor under the Commission's rulemaking.

As outlined in the Statement of Facts, *supra* ,8-9, the Commission, through its Licensing Appeals Board, had held that the issues of fuel reprocessing and waste disposal were not to be considered in the licensing proceeding for the plant. Decision of the Atomic Safety and Licensing Appeal Board of June 6, 1972, ALAB-56, App. 112, 115; Decision of the Atomic Safety and Licensing Appeals Board of February 28, 1974, ALAB-179, App. 130, 136-7.

Subsequently, in promulgating its final rulemaking with respect to the nuclear fuel cycle, the Commission specified that no consideration of fuel cycle issues need be provided in cases where any Final Environmental Statement had been circulated prior to June 6, 1974. 10 C.F.R. Part 51, § 51.20(e), App. 398. By virtue of the fact that the Statement for Vermont Yankee had been circulated prior to June 6, 1974, no consideration of waste disposal and fuel reprocessing was undertaken pursuant to the amendment to the Commission's rules, either.

government conceded that an Environmental Impact Statement for a nuclear power plant must consider fuel cycle issues when it proposed the rule under review in this case.)

In support of its position, Vermont Yankee half-heartedly relies upon this Court's decision in *Kleppe* v. *Sierra Club*, *supra*. Vermont Yankee's Br. at 39-45. In *Kleppe*, this Court held that NEPA did not require the preparation of a programmatic Environmental Impact Statement with respect to the leasing of coal development lands in the West because the Interior Department did not have a coherent plan or program for leasing coal-bearing lands. In a strained analogy, Vermont Yankee urges that the environmental impact of nuclear wastes are similarly remote from the operation of a nuclear power plant.

The differences between these two situations are obvious. The environmental impacts of reprocessing and disposal of spent fuel from Vermont Yankee are a direct, irreversible consequence of the operation of the facility. They are "adverse effects," "irreversible and irretrievable commitments," NEPA, Section 102(2)(C)(ii) & (v), 42 U.S.C. § 4332(2)(C)(ii) & (v), that cannot be avoided once the reactor begins operation. As the Court of Appeals stated, the environmental effects of nuclear waste reprocessing and disposal are as much a part of operating Vermont Yankee as are the environmental effects of "the stack gases produced by a coal-burning power plant." App. 33.[53] The contrast with the wholly separable coal

[53] The correctness of this statement was recently recognized by the Congress. In enacting the Clean Air Amendments of 1977, it mandated the Environmental Protection Agency to develop ambient air quality standards for radioactive releases from nuclear power plants, and the States to develop "State Implementation Plans" containing emission limitations for these emissions, through precisely the same regulatory mechanism that had previously been used to develop such standards and limitations for sulfur oxides, par-

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leases involved in *Kleppe* could hardly be more stark. Thus the Court of Appeals was entirely correct when it stated that

> "What the agency may not do, consistent with NEPA, is to fail to give these issues consideration in either [the licensing or rulemaking] forum."

App. 40, n. 17.

## CONCLUSION

Respondents have previously urged that the Court of Appeals' decision was an unexceptionable exercise of the federal courts' supervisory powers over the administrative agencies. The Commission's rulemaking was a far cry from reasoned decisionmaking. Rather, it amounted to an attempt to stifle public discussion of some of the most profoundly troubling issues concerning the Nation's rapidly increasing dependence on nuclear power stations. Though embarrassing to the Commission, these issues must be addressed.

Experience has shown that when foreign governments have denied a forum for the presentation of sincerely held and reasonable concerns over these issues, extra-legal action has sometimes been the result. In several countries, disagreement over nuclear power has produced violent confrontations. Even in this country demonstrators have recently occupied the site of a proposed nuclear power station in New Hampshire.

It is the duty of the courts to forestall the development of the perception of government illegitimacy that fosters resort to such measures. In commanding the Commission

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ticulate matter, and nitrogen oxides emissions from fossil-fuel fired power plants. Section 120(a) of the Clean Air Amendments of 1977, adding a new Section 122 to the Clean Air Act, 42 U.S.C. 7422.

to confront its critics on nuclear wastes within legal processes, the Court of Appeals thus acted wisely as well as according to law. Its judgment should be affirmed.

Respectfully submitted,

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September, 1977

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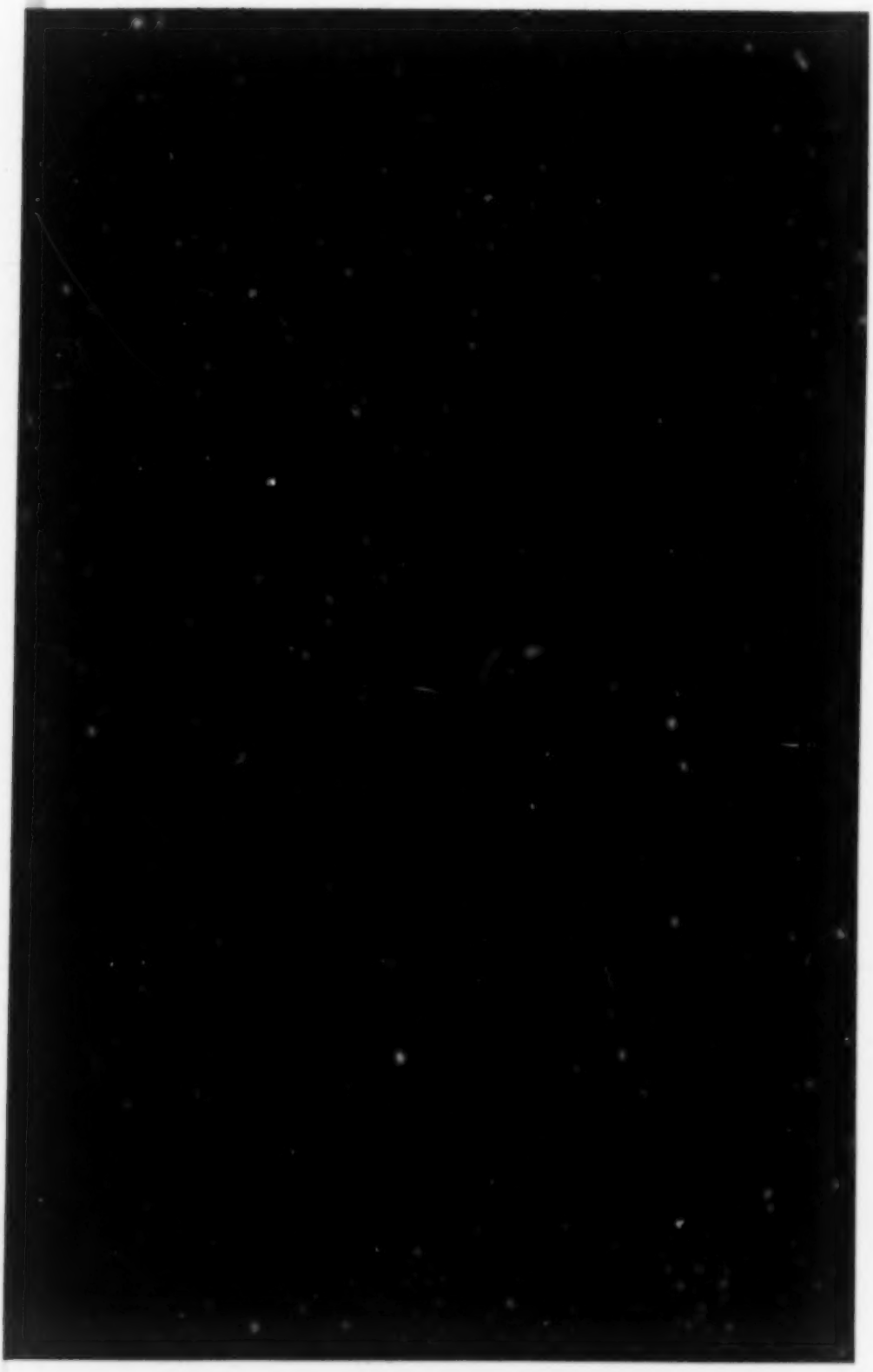

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# COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL, INC., ON THE ATOMIC ENERGY COMMISSION'S ENVIRONMENTAL SURVEY OF THE NUCLEAR FUEL CYCLE

Submitted by:

TERRY R. LASH, Ph.D.
January 26, 1973

## I. INTRODUCTION

The Natural Resources Defense Council, Inc. (NRDC), finds the Environmental Survey of the Nuclear Fuel Cycle inadequate as a comprehensive analysis of the environmental impact of the nuclear fuel cycle and seriously deficient as a supporting document for the environmental impact statements of individual nuclear power plants. These defects are so serious that the survey is not useful for informing the public about the environmental effects of relying upon nuclear power plants as a major, national source of electrical power. Without a detailed study of the total environmental impact of the nuclear fuel cycle, a rational choice among the alternatives for electrical power production cannot be made. Therefore, the AEC should issue a revised survey in order to inform the public fully about the environmental consequences of using nuclear power plants to produce electrical power.

## II. SCOPE OF SURVEY

Major defects of the survey statement are its failure to consider: (1) the *total* environmental impact of *all* nuclear power plants that are in operation, under construction or planned for construction; (2) the cumulative environmental effects over the entire lifetime of each plant; (3) the plutonium fuel cycle; and (4) the liquid metal fast breeder reactor. The environmental effects due to using nuclear power are apparently reduced by a factor of 200 to 1000 in the survey by considering only one plant rather than the aggregate of planned operational plants. Orders have already been placed for 177 nuclear power plants as of December, 1972, and it is estimated that 1000 plants will be in operation by the year 2000. (WASH-1250. The Safety of Nuclear Power Reactors and Related Facilities, December, 1972.) The total impact of all these nuclear power plants should

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have been assessed in addition to the analysis of only one model plant.

Because each nuclear power plant may be used for 30-40 years, the environmental degradation caused over a plant's expected lifetime should have been reported. By normalizing outputs to one year of production the total environmental impact was apparently reduced by a factor of 30-40. Therefore, the cumulative consequences of constructing and operating a nuclear power plant should be listed in addition to its annual effects. Furthermore, the fate of the plant after it has stopped operating should be described. No mention of its continuing environmental hazard is made.

Plutonium is a natural fission product of a light water reactor (LWR) and must be handled at reprocessing plants. Furthermore, the reclaimed plutonium will be required as a fuel during a substantial portion of an LWR's 30-40 year design life due to the scarcity of the currently used fuel U-235. Thus the plutonium fuel cycle is central to the issue of nuclear power production. The fact that ". . . the prospective utilization of such plutonium recycle fuel is somewhat uncertain since the actual timing and the extent to which the recovered plutonium will be recycled is an economic matter to be considered by each utility" does not relieve the AEC from considering the *potential* environmental hazards of plutonium.

Plutonium is one of the most hazardous chemicals known. For plutonium dioxide particles about one micron in diameter, Donald Geesaman has estimated that for every 10,000 particles inhaled by a human population one fatal human lung cancer will occur. (GT-121-70, Plutonium and Public Health. Presented at University of Colorado, April 19, 1970). There is the same effect whether the 10,000 particles are inhaled by only one person or whether each of 10,000 people inhale one par-

ticle. By 1980 a model reprocessing plant will recover annually about 1500 metric tons of uranium and 8110 kilograms of plutonium. (John W. Gofman, In testimony before the Nuclear Study Committee of the Legislature of the State of South Carolina, Columbia, South Carolina, January 7, 1972). If only one-tenth of one percent of the annual production of plutonium were released as one micron sized particles and if only one-hundredth of one percent of the released particles were inhaled by humans, the plutonium would be responsible for 14 million fatal human lung cancers. Therefore a complete, detailed discussion about the processing, storage and transport of plutonium is required.

In the near future, plutonium will be used as fuel for liquid metal fast breeder reactors (LMFBR). The rapid development of LMFBR's is essential for the continued availability of relatively inexpensive nuclear power because they can utilize the most abundant U-238 isotope of uranium. The LWR's on the other hand can only use the relatively scarce U-235 isotope. Thus the facts that LMFBR's use plutonium and the LMFBR's are projected to become the major source of nuclear power in the next few decades strongly suggest that any discussion omitting LMFBR's is grossly deficient.

## III. DISCISSION OF ENVIRONMENTAL IMPACT

Insufficient information for a realistic appraisal of environmental impact is presented in many parts of the survey. The omissions on two topics are especially disturbing. First, almost no consideration is given to the environmental consequence of rare or low probability events. For instance, in the discussion of temporary storage of liquid high-level radioactive wastes at reprocessing plants it is stated that ". . . the probability of an accidental release of radioactivity is considered to be extremely low and thus there would not be any signifi-

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cant release to the environs." Not only are the very important qualifiers "extremely" and "significant" neither defined nor approximated in quantitative terms, but more importantly the potential results of substantial release to the surroundings are not even mentioned. The possibilities of evacuation of the local populous, the occurence of lung cancer among the exposed population, the costs of decontamination, and the possibilities of severe radiation exposure should be set forth in straightforward terms. Descriptions of the consequences of other events are similarly avoided by simply labeling them "incredible". The term incredible has no place in a technical report and it should be replaced by quantified probabilities. The dismissal of so-called low probability/high consequence events is not justified because there has not been a sufficiently long history of operating plants to judge probabilities accurately and because there is no way of predicting the chances of sabotage and terrorism against nuclear installations. Indeed, recent world and U.S. history suggest that even what were formerly incredible acts of violence now seem only too possible.

The second area containing major omissions is the discussion of long term storage of high-level radioactive wastes. No details about the "near-surface engineered storage facility" which will be built about 1980 are presented. Indeed, it is not even pointed out that the reprocessing plant operating at West Valley, New York, since 1966, apparently will not be able to comply with the AEC's regulation which prohibits the storage of high-level radioactive wastes at reprocessing plants for more than 10 years. More importantly, however, there is no discussion devoted to the problems associated with establishing a permanent, absolutely secure depository for the high-level radioactive wastes that will remain hazardous to man for tens of thousands of years. There is not even an analysis of the decision to no longer consider

the salt mines at Lyons, Kansas, as a satisfactory storage facility. A candid analysis of the necessity of permanently securing the high-level wastes and a full description of the requirements, including protection against sabotage, for permanent storage is needed.

The survey gives the impression of having been prepared hurriedly and almost carelessly. For instance, on page G-10, it is stated: "The spent fuel from a model LWR processed annually in a fuel reprocessing plant produces approximately 1000 gallons of radioactive liquid waste which, when converted to solid, weighs approximately 1.4-2.3 MT." Since for each ton of fuel reprocessed about 330 gallons on high-level liquid waste is produced, a model LWR yielding about 30 MT of spent fuel annually will produce about 10,000 gallons of liquid waste rather than the stated 1000 gallons. (WASH-1250. The Safety of Nuclear Power Reactors and Related Facilities, December, 1972.) Furthermore, Dr. Frank Pittman who is Director of the Division of Waste Management and Transportation at the Atomic Energy Commission has reported that a 1000 MWe nuclear power plant will produce about 8 tons of solidified waste rather than the stated 2 tons. (Remarks by Dr. Frank K. Pittman, before the American Nuclear Society Meeting, November 16, 1972.) Other errors can be found in the report, also. On page E-2 the amount (26 MT) of waste $CaF_2$ appears to have been underestimated by 30 percent if the figures given for the capacity of the model fuel fabrication plant are correct. About 34 MT of $CaF_2$ per model LWR plant would result annually from the neutralization of the $UF_6$ produced from 34.6 MTU which is the annual contribution from one model LWR. Thus, the presentation should be carefully reconsidered in order to eliminate these and any other gross errors.

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## IV. CONCLUSION

NRDC finds the Survey sufficiently inadequate in scope of content and in completeness of discussion that it cannot usefully serve either as a supporting document for individual environmental impact statements or as a comprehensive survey of the environmental impact of the nuclear fuel cycle. In order to assist the public in understanding the environmental implications of using nuclear power plants to meet the national electrical energy requirements, the survey must be enlarged to include complete and detailed discussions of the plutonium fuel cycle, the cumulative effects of the entire complement of nuclear power plants and the environmental impact of the fast breeder reactor program. The topics which are covered in the survey need to be analyzed more accurately and in greater detail.

Docket No. RM 50-3

In the Matter of

AMENDMENT OF 10 CFR PART 50—LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

(Environmental Effects of the Uranium Fuel Cycle)

## COMMENTS OF THE SIERRA CLUB ON "ENVIRONMENTAL SURVEY OF THE NUCLEAR FUEL CYCLE"

The Sierra Club submits herewith its comments on the Commission's "Environmental Survey of the Nuclear Fuel Cycle" and requests that these comments be made part of the record of the rule-making hearing to be held on February 1 and 2, 1973. The comments are intended to supplement comments and testimony offered by the Consolidated National Intervenors, of which the Sierra Club is a member.

Our comments are in two parts: Part One contains general observations on the Survey and the Commission proceedings, and Part Two focuses on specific features of the Survey.

### GENERAL COMMENTS

This Survey or a successor document is clearly intended to play an integral role in the Commission's efforts to comply with the National Environmental Policy Act (NEPA) in regard to the environmental impact of civilian nuclear fuel cycle operations. Although we note the Survey's statement that it is not intended to be a detailed environmental statement under the Commission's NEPA regulations, the Commission's notice of November 15, 1972 (37 Fed. Reg. 24191) indicates that it does propose to use the Survey as evidence that NEPA has been complied with in LWR licensing proceedings. Such

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use is contemplated under each of the two alternative regulations on which comment is invited by the notice.

The Survey is a useful document in many respects, but the Sierra Club is convinced that it is not legally or technically sufficient for its intended use. Many of the most important environmental risks and costs associated with the supporting fuel cycle for the nuclear power industry have been arbitrarily omitted from consideration or incompletely analyzed. Among the most prominent of these are plutonium handling and recycling, long-term storage of high-level wastes and thermal pollution. Our detailed criticisms of these and other areas where the Survey is inadequate are contained in Part Two.

As a result of these shortcomings, the environmental costs of the fuel cycle are seriously underestimated in the Survey. Thus the conclusion, under consideration in the Commission's first alternative, that these costs are sufficiently small as not to affect the cost-benefit analysis for an LWR, is not tenable. Even if the Survey's omissions and inadequacies in specific areas of environmental impact were disregarded, it still would not support the conclusion that the costs of the fuel cycle are negligible. In the absence of a common denominator by which to make direct comparison of the costs and benefits of a particular LWR, the final decision embodies large elements of judgment and subjective evaluation. The Survey does not attempt to elucidate this process of judgment and evaluation with regard to the costs of the fuel cycle. For the most part, the Survey is an exercise in data collection which is useful as far as it goes, but does not resolve the problem of translating the data into a meaningful environmental assessment. The selective comparisons of fuel cycle impacts to the impacts of coal-fired plants or the nuclear power station itself are misleading and unproductive because no such comparisons

are drawn in areas such as radiological effluents, where the comparisons would be adverse to the fuel cycle facilities.

The Survey is also unsuitable for the use proposed in alternative 2 because the costs of the fuel cycle are not fairly and completely set forth. Under the Commission's Rules of Practice, the Survey would be effectively insulated from challenge in LWR licensing proceedings once adopted for use in the manner proposed. Any correction of its basic shortcomings would have to take place in further rule-making proceedings. Meanwhile, the validity of licensing proceedings conducted along the lines of alternative 2 would be in doubt because of these shortcomings.

Until the Commission has resolved the inadequacies of the present Survey by more extensive findings and investigation in these rule-making proceedings, we believe the environmental impacts of the fuel cycle must be subject to examination by the Staff, the licensing Boards and interveners in the NEPA phase of individual licensing proceedings. We also believe the Commission should recast these rule-making proceedings to provide for the rights of discovery and cross-examination. Only by permitting the probing review afforded by these procedures can the Commission satisfy the mandate of NEPA and the public's demand that the environmental costs of the fuel cycle be explored to the full limit of our present intelligence. In undertaking this initial Survey, the Commission has taken an important step toward its goal of a comprehensive and reliable generic evaluation of the fuel cycle's environmental effects. We believe it can sooner realize that goal by opening the process of investigation and analysis to fuller public scrutiny and participation.

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## SPECIFIC COMMENTS

*Plutonium Recycling*

The Survey's most serious omission is its failure to consider the environmental impact of plutonium recycling in light-water reactors (LWRs). The Survey states that recycling of plutonium will be considered as an alternative LWR fuel cycle in a later document, but no date for the document is given. (S-2). The apparent rationale for deferring this vital matter is that the advent of plutonium recycling will vary somewhat between utilities, according to economic situations. (F-16-17). This variation in timing is the only reason given for not considering plutonium in the present Survey. The Survey does not question that plutonium will be recycled in the present generation of LWRs, and in fact affirms that the feasibiliy of mixed plutonium-uranium dioxide fuels has been shown. (*Ibid.*).

A lengthy discussion of the staggering problems in handling plutonium on a large scale is not necessary. Plutonium's extraordinary toxicity, radioactivity and longevity are well-known sources of concern to everyone in the nuclear industry. Almost as disturbing are the possibilities that diverted plutonium produced in LWRs could be traded in an international black market and used for production of nuclear explosives by unauthorized parties.

At the assumed 80 per cent load factor, the 1000 MWe plant considered in the Survey will produce slightly less than 200 Kg of plutonium per year. The Survey's estimates that about 2-3 MT of plutonium will be recovered annually by 1975, and about 15 MT by 1980 (F-16), therefore correspond to about 10-15,000 MWe and 50,000 MWe of generating capacity respectively. The Survey's overview states, however, that there is

already 10,000-12,000 MWe of operational nuclear power plants in the United States (0-1). In addition, several more operating licenses have been granted in recent months. For 1980, the Survey estimates that 140,000-150,000 MWe of nuclear generating capacity will be operational. (0-4). Thus it appears that, by the Survey's own figures, the amount of fissile plutonium passing through reprocessing plants in 1975 and 1980 has been underestimated by a factor of at least 2 and possibly 3.

Some reactors are already being fueled with mixed plutonium fuel, including Consumers Power's Big Rock Point plant and the San Onofre plant of Southern California Edison. Other plants will soon follow suit or may already be doing so. One of the sources cited in the Survey states flatly that "plutonium recycle in LWRs is an economic necessity in the U.S." Dawson, *et al.*, *Plutonium Utilization in Light-Water Reactors*, 4th U.N. Int'l Conf. on Peaceful Uses of Atomic Energy, A/CONF 49/P/071 (Sept. 1971). At least two utilities (Consumers Power and Duke Power) have filed comments urging the Commission to consider plutonium recycling in these proceedings or related proceedings to be promptly instituted.

Certainly the variations in utility plans for use of plutonium fuel in LWRs present some difficulties in quantitative analysis of the resulting environmental impact, but these difficulties are not insurmountable. The Survey deals with similar problems in other areas, such as the alternate methods now in use for production of $UF_6$ (C-1-2), and the use of underground or open-pit mining for uranium (A-1). In the case of plutonium recycling, the analysis could proceed on the basis of either a best estimate by the Commission of the extent of such recycling by 1980 or a survey of utilities to determine their present plans for that period. Either method would yield at least a range of alternate futures that would be

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vastly preferable to the absence of any analysis in the present Survey. Furthermore, the problems of handling plutonium in the LWR fuel cycle can be meaningfully discussed even though the magnitude and timing of recycling are uncertain. The environmental challenges are immense even if only a very small fraction of the plutonium produced by LWRs is recycled. Thus the model reprocessing plant servicing the annual needs of 26 LWRs will be handling more than 5 MT of plutonium per year, even if the material is stored rather than recycled. The tolerable releases of plutonium to the environment through losses in reprocessing are extremely small, yet Section F of the Survey contains no discussion of either the existing or expected magnitude of these releases. Similarly, in the event of recycling, process losses at the fabrication plants would have to be drastically reduced from the 1% levels assumed for uranium (S-6), in order to limit plutonium releases to tolerable amounts. Yet the abilities of the reprocessing and fabrication plants to limit such losses are not discussed.

*HTGR Fuel Cycle*

The fuel cycle of the high-temperature gas reactor (HTGR) presents a series of difficult problems, particularly in dealing with fission products. We can agree that attempting to treat those problems in the present Survey might have detracted from the Survey's coherence. The recent increase in utility orders for the HTGR shows, however, that the environmental impact of its fuel cycle must be addressed at a very early date. The Survey gives no date for comparable proceedings in regard to the HTGR. Failing such proceedings, complete analysis of fuel cycle environmental effects in reactor licensing proceedings will be the only available method for compliance with the National Environmental Policy Act of 1969.

*Thermal Pollution*

The Survey fails to quantify or discuss in any significant way the thermal pollution associated with the fuel cycle. According to the Survey, the supporting fuel cycle for a 1000 MWe reactor consumes electrical energy equal to 4 to 5 per cent of the reactor's annual output and produces waste heat equal to about 7 per cent of that produced by the reactor (S-14, S-16). In both instances, the effect is overwhelmingly concentrated in the enrichment phase of the fuel cycle and is chargeable to the operations of the three gaseous diffusion plants existing in the United States (S-17). These effects are by no means insignificant, despite the modest appearance of the percentages. Any single industry or consumer which accounted for 4 to 5 per cent of the electric energy generated by nuclear power stations would have to receive major consideration in a demand-oriented analysis of the environmental effects of producing that energy. Similarly, since thermal electric generating plants are the major source of waste heat discharged to the biosphere and nuclear power plants contribute disproportionately to that effluent, an industry which discharges to the environment an amount of waste heat equal to 7 per cent of that discharged by all nuclear power plants is an important potential source of thermal pollution.

After quantifying these effects, however, the Survey does nothing toward analyzing their impact. The Survey dismisses the entire problem on the basis that the electricity which powers the diffusion plants is drawn from large utilities which discharge effluent to many water bodies, and the effect is therefore difficult to estimate. (S-36, D-5, D-13, D-26-27).

The Survey could have discussed this problem in meaningful terms, notwithstanding the difficulties in pinpointing the precise contribution of the nuclear fuel cycle to thermal pollution of affected water bodies. The power

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in question comes from three utilities. (D-13). What are the major bodies of water which receive the discharges from the generating stations of these utilities? What contribution are these discharges making to the thermal load imposed on these water bodies, and what evidence exists that thermal loading is causing adverse effects to these water bodies and their biota? What portion of the power generated by these utilities is delivered to the gaseous diffusion plants, and what portion of the incremental demand for power from these utilities is represented by projected expansion of operations at these plants for civilian fuel production? Questions such as these could be the starting-point for a meaningful discussion of thermal pollution caused by the fuel cycle, even if limitations of data prevented a complete answer at present. Unfortunately, the Survey offers no encouragement that these questions were even asked. This omission takes on added importance because the Survey elsewhere relies on the future substitution of nuclear power plants for coal-fired plants in powering the gaseous diffusion plants as a source of environmental improvement. (O-14, 15). These projected future benefits must be discounted by the increased thermal pollution that is likely to result.

*Total Environmental Impact of the Fuel Cycle*

A critical defect in the Survey is that the *total* environmental impact of the fuel cycle is not set forth at any point. Although the Survey is replete with tables and charts, many of which are very helpful, the Survey merely suggests that the effects of the entire fuel cycle for the present and for 1980 can be arrived at by performing an extended series of computations from various other tables. (S-44). Conceivably, the total effects of the fuel cycle are treated in this peripheral way in the belief that only the incremental impact of a single plant is relevant in the licensing proceedings where the Survey

is designed to be used. Clearly it is important to know this incremental impact, but it is equally important for decision-making purposes to assess the acceptability of that impact in light of the collective effect that many similar decisions will ultimately have. Otherwise, the mistakes of the past may be repeated through the "tyranny of small decisions" against which the NEPA is directed. We find it very regrettable that the Survey does not candidly state the net impact of the LWR fuel cycle. In this respect the Survey belies its own title, and this defect alone casts a grave doubt on the propriety of its use in individaul licensing proceedings.

*Fuel Cycle Effects After 1980*

A related defect is the Survey's failure to address the problem of environmental impacts beyond the 8-year time frame to which it is limited. Admittedly, forecasts become less reliable as the time frame lengthens, and at some point they enter the realm of speculation. Nevertheless, the Survey must address these longer-term questions. It assumes that the model LWR will have an operating life of 30 years. (S-7). Thus reactors licensed in the present decade will have fuel cycle effects until the year 2010 in some cases. If these post-1980 effects are not assessed now, they will never be assessed for the present generation of LWRs. Since other benefits and costs of these reactors are calculated in relation to the reactor's entire useful life, the environmental costs of the supporting fuel cycle are underestimated if the analysis stops at the year 1980. If no further analysis is considered feasible at this point, the Commission should explore the possibility of periodically reviewing the fuel cycle impact of LWRs as this impact becomes more clearly defined with the passage of time. At the very least, there should be an explicit commitment to periodic updating of the Survey itself; otherwise, a reactor might

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be licensed in 1978 with consideration of the fuel cycle effects extending only to 1980. The process of periodic review should include hearings giving members of the public the opportunity to contribute to the review and to probe the bases of the Survey's conclusions.

*Radioactive Releases "As Low As Practicable"*

The Survey does not explore in any manner the application to the operations of the fuel cycle of the concept that releases of radioactive effluents should be "as low as practicable." Throughout the discussion, release rates are compared to the maximum permissible concentrations set forth in 10 CFR 20, and the possibility of developing quantitative equivalents of "as low as practicable" similar to those in proposed Appendix I for nuclear power stations is not considered. Whether or not a specified environmental cost is tolerable depends considerably on whether it can reasonably be avoided. On this point, the Survey is uninformative and the problem is not satisfactorily addressed by the qualification (not consistently adhered to throughout the Survey, in any event) that only minimal allowance is made for future technological advances. We agree that the Survey should confine itself to present techniques and not speculate on future achievements. This does not mean, however, that the Survey should ignore any technology which is *presently available* but not incorporated in present facilities for economic or other reasons. A complete Survey must examine such possibilities, particularly in regard to the practicability of reducing radioactive effluents below existing levels in accordance with the overriding mandate of 10 CFR 20.1(c). In addition, the release rates are apparently based in several instances on AEC projections or information furnished by the operators of the facilities, rather than recorded data. (S-11, S-12). In light of the recent disclosure that releases from the Vermont Yankee plant are 3-8 times

greater than advance projections, the possibility that present releases are greater than the assigned figures is clearly suggested.

*Liquid Effluents*

Throughout the Survey there is reliance on dilution by water bodies to achieve even those concentrations permitted by Part 20. (S-32, D-26). This approach is questionable not only from the standpoint of radiation control, but equally from that of water quality control. Similarly, in respect to chemical effluents, the Survey relies on dilution to achieve "source water quality." (S-27, D-24, E-23, 24). Under the 1972 Amendments to the Federal Water Pollution Control Act now in effect, (P.L. 92-500), water quality standards will largely be supplanted by effluent standards for individual dischargers. The key indicator of the environmental impact of point sources such as those discussed in the Survey, therefore, is not the condition of the receiving water after full dilution, but the quality of the effluent itself. Since the Survey's reliance on 1968 Water Quality Criteria is now outmoded, all portions concerning discharges to navigable waters must be revised as the Environmental Protection Agency establishes effluent requirements applicable to the facilities in question.

*Storage of High-Level Wastes*

The Survey attempts to deal with the problem of interim and long-term storage of high-level radioactive wastes by denying that any such problem exists. The reader is merely assured that the Commission will design and build a storage facility within the next ten years that will preclude significant releases to the environment for 100 years, and that this 100 years will be utilized to discover a more permanent method that will likewise preclude such releases. (S-43, G-3, G-11, G-18,

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G-20). In a religious document, this would be considered an article of faith.

No concept or details of the storage facility are set forth; hence there is no discussion of the probabilities of accidental releases, but only the bald statement that "the facility will be designed to withstand all credible natural forces and man-created accidents so there will be no release of radioactive material outside the facility." (G-20). If some other structure such as a bridge were in question, the presence of such unsolved problems might be tolerated on the assumption that the facility would not be constructed until the problems were solved, however long that took. This approach is not acceptable for a structure that *must* be built in a rather restricted time frame. Indeed, the Survey shows even though it does not directly concede, that the time may already be too short for full compliance with the requirement in Appendix F of 10 CFR Part 50 that high-level wastes be transferred to a Federal repository no more than 10 years after separation from the spent fuel. Even the brief discussion in Section G of the Survey shows that construction of the interim storage facility will be a large and complex undertaking. Plans are now said to be in the development stage, but there is no indication when a specific concept will be put forward for examination prior to preparation of detailed plans and specifications. (G-11). Furthermore, it appears from the meager information provided that no allowance has been made for unsuspected problems, re-evaluation and even abandonment of the plans as in the case of salt mine storage. Thus there are valid grounds to question whether the 1980 commitment is realistic and achievable. If it is not, Appendix F in its present form will be seriously violated. Amending the regulation would solve the problem in a technical sense, but the requirement was presumably adopted with due regard for the

hazards and limitations of on-site storage at the reprocessing plants, and there is no evidence that it is unduly conservative. Hence the Survey is totally inadequate in its treatment of a paramount environmental problem which neither the Commission nor the civilian nuclear industry can escape.

*Major Accidents*

The Survey's treatment of accidents is flawed by a persuasive tendency to classify the most serious kinds of accidents as "highly improbable" (S-36), "infinitesimally small," (S-43), etc., without specific supporting estimates of probability. Without question the probabilities of the most serious types of accident are very low, but this affords no excuse for failing to assess any probabilities greater than zero. Even very low probabilities can assume significance in light of the projected growth of the civilian nuclear power industry within the lifetime of the LWRs now being licensed and the concomitant growth of fuel cycle operations. In relation to the magnitude of these future operations, our experience to date is so limited that it has very little statistical significance as a guarantee of safety.

*Effluents In "Restricted Areas"*

The Survey implies at several places that waste discharges allegedly confined to "restricted areas" need not be considered as effluents to the environment (*e.g.*, S-27, B-20). These statements appear to reflect the belief that environmental harms can be disregarded by classifying the area in which they occur as restricted. We do not question the designation of certain areas as "restricted" for the purposes of protecting the public health and safety, but this does not mean that the areas so designated are no longer part of the environment. The Sur-

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vey treats many of these areas as land temporarily committed, but there is little or no discussion of how much time and money will be required to return these areas to unrestricted use at termination of the activities in question. Appendix F of 10 CFR Part 50 states with respect to fuel reprocessing plants, for example, that "a design objective . . . shall be to facilitate decontamination and removal of all significant radioactive wastes at the time the facility is permanently decommissioned. Criteria for the extent of decontamination to be required upon decommissioning and license termination will be developed in consultation with competent groups." The Survey does not refer to any such criteria, and we are not aware that any have been promulgated by the Commission. Therefore, considerable uncertainty exists as to the realistic possibilities for overcoming the environmental damage caused to restricted areas and returning them to a benign condition.

Moreover, there have already been instances where effluents supposedly confined to restricted areas have penetrated the off-site environment. The most notable of these is of course the use of uranium mill tailings for construction in the Grand Junction area (see, *e.g.*, 37 Fed. Reg. 25918, Grand Junction Remedial Criteria). But in addition, radioactive material has been leached from tailings by rain water and entered the ground water system, resulting in excess downstream concentrations in the Colorado River. Windblown plutonium from wastes at the Rocky Flats weapons production facility likewise caused excessive off-site concentrations. These experiences bring into serious question the Survey's premise that effluent discharges in restricted areas are without environmental significance.

*Violations of Effluent Standards*

The Survey is ambiguous in many instances on whether discharges from fuel cycle facilities are or are not violating applicable standards. At S-26, fluoride concentrations of 005-2.0 micrograms/$m^3$ are said to "span the range of existing state standards," even though they apparently exceed the Washington State standard of 0.5 micrograms/$m^3$. At S-28, enrichment plant liquid effluents are described as "generally within the range of permissible standards." This description could encompass any situation from occasional minor violations to frequent large-scale transgressions. At D-21, the Survey states with no further elaboration that an off-site $SO_2$ concentration of .025 ppm is "within the range" of EPA's annual mean standards of .02 ppm. In plain English, it exceeds the standard. Similar lapses of candor are present in other instances where the Survey encounters emissions which exceed the reference standards. (*E.g.*, B-15). Since the Survey consistently regards compliance with radiological and other standards as evidence of satisfactory environmental performance, the public is entitled to have a clear statement of those many instances where even this degree of assurance is absent.

*Long-term Buildup of Krypton 85*

The Survey states at the outset that it is unrealistic to express concentrations and dose rates in terms of the annual operation of the model LWR and that such radiological considerations will be expressed with reference to operations of the fuel cycle facilities themselves (S-11). In the important case of krypton 85, however, the Survey does not discuss long-term buildup in the atmosphere from the overall operations of the reprocessing plants, but only from the minor contribution attributable to the model LWR. (S-31, F-5). Thus the Survey does not

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even provide the baseline data for a meaningful discussion of the problem, and no such discussion is found.

Respectfully submitted,

SIERRA CLUB

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ENVIRONMENTAL PROTECTION AGENCY
RADIATION OFFICE
Rockville, Maryland 20852

January 19, 1973

Secretary
U. S. Atomic Energy Commission
Washington, D. C. 20545

ATTN: Chief, Public Proceedings Branch

Dear Sir:

The AEC rulemaking proposal on amendment to 10 CFR Part 50, Appendix D, published in the *Federal Register* on November 15, 1972, which "would specifically deal with the question of consideration of environmental effects associated with the uranium fuel cycle in the individual cost-benefit analyses for light-water-cooled nuclear power reactors" has been reviewed. The EPA has expressed the intention to be a limited participant in the proposed hearing by memorandum to the AEC dated December 29, 1972. The comments offered below will be expanded by oral testimony at that time.

Ideally, we believe that in evaluating the environmental effects of the fuel cycle as related to a reactor, such effects, to the extent possible, should be related to the specific fuel cycle plants that support a given reactor. We recognize that at present and for the presently foreseeable future it would be impracticable to adopt such an approach because this kind of information is not available. Therefore, within the confines indicated below we are in agreement with the generic approach used by the AEC in its report, and believe the report provides an adequate consideration of the environmental effects of the present

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uranium fuel cycle for purposes of the rulemaking. The AEC is to be commended for considering the total fuel cycle in evaluating the environmental aspects of light water reactors and should be encouraged to pursue this effort.

In view of the expected growth in nuclear power and the development of new and improved technology, we recommend that the AEC make it clear that it does not intend by this rulemaking action to foreclose future consideration of fuel cycle impact as related to reactors. This assurance can be given by stating in the rule that the environmental effect of the fuel cycle will be periodically evaluated and updated as new information is developed. We believe an effective period for the guidelines should be specified. We recommend a 2-year period in support of this position. One specific area that should be further examined is the disposition of high-level waste. While the concepts of dealing with such wastes have been developed, the detailed criteria being developed need to be evaluated in terms of environmental impact. Another specific area concerns radiological dose assessment. The AEC report considers average contribution of the total nuclear fuel cycle to the total environmental impact of a specific nuclear reactor. We believe that in the future as more data becomes available, estimates of regional impact should be made. In addition the control technologies for risk reduction and the procedures for evaluating the environmental impact of effluents are in a constant state of development as new techniques, methods, and information become available. This requires a periodic reexamination of the policies and procedures used for evaluation of the environmental impact of nuclear facilities. This problem of constantly evolving technology and the difficulty in quantifying the prorated impact of all fuel components, further supports our belief that periodic reassessment of the total environmental impact of the fuel cycle is essential.

Neither of the two alternatives proposed specifically address the problem of periodic review in a specified time period. As such, we feel they are unacceptable without modification. We recommend that Alternative 1 be adopted with the provision of periodic reassessment of fuel cycle input, the first period for reassessment being no longer than two years.

The EPA does not entirely concur with that section of Alternative 1 of the proposed rulemaking which states that ". . . since the environmental effects of those activities as related to a particular light-water-cooled nuclear power reactor have been analyzed in the Commission's *Environmental Survey of the Nuclear Fuel Cycle* and when factored into the cost-benefit analysis, are sufficiently small as not to affect significantly the resultant conclusion." We believe this to be a judgment factor which may change as additional information is developed. However, within the above-recommended limited effective period of the proposed rulemaking, we do agree that the committed environmental impact will be sufficiently small to justify such a statement. This recommendation in no way diminishes the responsibility of the EPA to set generally applicable environmental standards for the total uranium fuel cycle and for its components.

As an additional comment not related to the rulemaking, we feel that this approach of looking at the total uranium fuel cycle is typical of that required for the broader issues associated with electric power generation and we recommend that AEC undertake studies of other fuel cycles, including non-nuclear, so there will be a base for assessing and comparing the cost-benefit for all the cycles.

In summary, the EPA believes that a more detailed follow-on assessment of the potential environmental impact of the total nuclear fuel cycle should be actively pur-

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sued by the AEC. In the final analysis, any decisions on the environmental impact of the nuclear fuel cycle must take into consideration similar impacts of other fuel cycles in order to determine the electrical energy source mix most suitable for this nation. Also, efforts should be expanded to develop appropriate guidelines and standards applicable to components of the nuclear fuel cycle. More specific comments on the Commission's "*Environmental Survey of the Nuclear Fuel Cycle*" are enclosed.

Sincerely yours,

/s/ W. D. Rowe
W. D. Rowe
Deputy Assistant Administrator
for Radiation Programs

Enclosure

cc:
Mr. M. D. Paglin, Chairman
Dr. J. C. Geyer
Dr. M. J. Steindler
Atomic Safety & Licensing Board Panel, USAEC

## SPECIFIC COMMENTS ON ENVIRONMENTAL SURVEY OF THE NUCLEAR FUEL CYCLE

### A. RADIOLOGICAL ASPECTS

1. Discussion of waste disposal is not complete enough in that it indicates that potential environmental releases will be avoided by design

without indicating how or describing potential releases that will be designed against. The ultimate disposal of radioactive wastes produced as a result of nuclear power generation is a critical parameter in the evaluation of the total environmental impact of this energy system. Although an acceptable ultimate disposal methodology has not been determined, the criteria that will be utilized in deciding on such a methodology should be set forth in any complete fuel cycle evaluation. These criteria should indicate what present and future risks the AEC would consider justifiable in a cost-risk-benefit analysis. An evaluation should be made of the chances for developing a methodology to meet these criteria and what compromises would be considered. Other specific comments on the waste disposal evaluation are:

(a) It does not include the disposal of "other than high-level wastes" produced by the reactor operation.

(b) It presents insufficient discussion of fuel hulls.

(c) The model of the high-level interim storage facility is inadequate.

2. The discussion of accidents for all components should present probabilities associated with the various consequences.

3. Since the report does not consider the HTGR, a more descriptive title would be "Environmental Survey of the Light-Water Reactor Fuel Cycle."

4. There is a lack of a consistent format for expressing the radiological effects of the various components of the fuel cycle. For some of the

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components, the effects are presented in terms of percentages of the 10 CFR 20 Appendix B limits at the site boundary; such is the case for milling, $UF_6$ production, uranium enrichment, and fuel fabrication. For the fuel reprocessing and transportation components, dose estimates are presented but not in a consistent format which will allow comparison of the various components of the fuel cycle. Some data on man-rem doses for fuel reprocessing and milling are presented in the Summary Table S-3, but no information on these doses is presented in the individual sections of the report devoted to these components of the fuel cycle.

It is suggested that the radiological effects of all of the various components of the fuel cycle be presented in terms of estimated man-rem dose to the population effected. It should also include information on doses to the maximum individual.

5. The information presented in Table S-3 on the discharges of radionuclides from milling and $UF_6$ production includes amounts of radionuclides discharged as liquids to on-site holding ponds. Since it is indicated that these radionuclides are not discharged to the uncontrolled environment, they should not be included in the effluent activity.

6. Table S-3 presented in the *Federal Register* of November 15, 1972 contains some values in the section under Radiological Effluents which are inconsistent with Table S-3 as presented in the *Environmental Survey of the Nuclear Fuel Cycle.* The liquid discharge of $^{234}Th$ and other uranium daughters are listed in the *Federal Register* as 0.001 curies and in the *Environmental Survey* as 0.01 curies. The tritium gaseous effluent in

the *Federal Register* is listed as 12 curies and in the *Environmental Survey* as 15.7 curies.

7. In the section under "Uranium Milling," it should be clearly stated how the AEC intends to regulate the stabilization and control of decommissioned uranium mill tailings ponds. A number of states with ongoing uranium milling activities do not have uranium mill tailings control regulations. The discussion presented in this section leaves the impression that no tailings control problems will exist under the present practices. The discussion in this section also indicates that tailing ponds are designed to prevent contamination of ground or surface water. This is definitely not the case for several of the mills located in EPA Region VIII (Colorado, Utah, Wyoming, and Montana). For instance, several mill ponds have been identified as leaching contaminants to the underlying strata containing ground water. Also, the Union Carbide Uranium Mill discharges on the average of 200 gpm of processed water effluent to the San Miguel River. This effluent contains over 10 g/1 of total dissolved solids which includes sulfate concentrations greater than 3.5 g/1.

8. In the section under "Fuel Fabrication" it would be appropriate to point out the differences in hazards of different chemical forms and enrichments of uranium. Soluble forms of uranium with less than 5% enrichment are a chemical hazard with the organ of interest being the kidney. All insoluble forms ($UO_2$ as an example) are a radiological hazard with the lung being the organ of interest. The above discussion is important in a public document since chemical toxicity is assumed to be a threshold effect and

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radiological effects are assumed to be non-threshold.

9. The iodine removal efficiency of 99.9% for fuel reprocessing plants appears to be optimistic based on past experience. The values for iodine discharges and resultant doses should be qualified with a statement indicating that the removal technology is unproven.

10. Strontium-90 and cesium-137 were shown to be the most dosimetrically significant radionuclides in the liquid effluents at Nuclear Fuel Services. Although the new waste treatment facility should reduce the significance of these radionuclides in the liquid effluent, it would still be appropriate to discuss the quantities of these radionuclides to be discharged and their dosimetric significance.

11. The volumes of low-level solid waste generated at a fuel reprocessing plant are presented in Table F-6 based on estimates from the Barnwell Environmental Report. Would it not be more appropriate to use the actual information obtained from the Nuclear Fuel Services? At least an indication of the variability and the reasons for it should be stated. Also, the data presented in Table F-6 on Page F-27 has no units.

12. A figure of $10^{20}$ fissions for a criticality accident at a fuel reprocessing plant may be a more conservative value than the $10^{18}$ fissions used in this report. The Midwest Fuel Recovery Plant uses a value of $10^{20}$ in their PSAR. Also, an accident at ICPP is reported to have exceeded $10^{18}$ fissions.

13. The Barnwell Environmental Impact Statement estimated 8 rail accidents per $10^6$ train miles. A value of 0.8 accidents per $10^6$ rail miles was

used in this report. The discrepancy should be resolved.

14. The dose to bone from the transuranic elements appears to be expressed as a yearly dose. It would be better expressed as a 50 year dose commitment resulting from an annual release.

15. The safeguard issue should be considered under the transportation section. A discussion of the procedures to be used for protecting the shipments against highjacking would appear to be appropriate as well as an evaluation of the possible consequences of a highjacking.

## B. AIR QUALITY ASPECTS

1. In general we find the subject document to be a relatively complete overview of the non-radioactive air quality aspects of the nuclear fuel cycle. It seems likely that some of the non-radioactive air pollution emission estimates are a little on the low side. However, without more precise information about the type and size of equipment, fuel specifications and quantities to be used at the various facilities discussed, these estimates appear to be as good as any others would be.

2. A discussion of measures to be implemented for the control of evaporative hydrocarbons from bulk fuel storage at any of these facilities should be provided.

3. Oxides of nitrogen should be added to the list of combustion products of petroleum used to fuel the heavy earth moving equipment discussed on page A-16. Furthermore, some quantitative estimates of the emission levels should be provided.

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4. The small quantities of sulfuric acid fumes, kerosene and dust mentioned on pages B-5 and B-14 should be quantified.

5. The 0.025 ppm off-site concentration of $SO_2$ (page D-21) is within the current Primary Ambient Air Standard; however, some additional $SO_2$ control will have to be installed to meet the Secondary Standard when they eventually become mandatory.

6. Some discussion of methods utilized to control dust should be provided in the section considering radioactive waste management.

C. WATER QUALITY ASPECTS

1. EPA does not believe that effluent dilution is an acceptable method of effluent control. There are several references in this report to the dilution of waste effluent streams prior to discharge to the environment. It is not clear as to whether this is a control mechanism or merely a statement of practice. Additional information on the methods of effluent control is necessary to determine if the procedures being used are acceptable.

2. The discussion of "accident consideration" relating to the milling operation, it is not clear whether the 5-foot minimum free board requirement takes into consideration flash flooding which is common to that geographical area.

3. The sections on accident considerations should discuss in greater detail the contamination of waterways resulting from potential accidents. For example, in the section under "uranium hexafluoride production," it is stated that a dike

failure would result in a significant environmental insult. More information on this effect should be presented.

4. The section on uranium enrichment should contain a discussion of the proposed water supply which would be used for a large scale uranium enrichment plant. This consideration should be carefully explored since it represents the "maximum case" for water natural resource utilization.

5. The section on the "overview of the total nuclear fuel cycle" should include a discussion of the future total water requirement.

6. More information is required on mixing zones, steam characteristics, etc. with respect to thermal discharges. The maximum temperature of any river should not be above 90° F for warm water fisheries. A 50° F rise in a trout stream may be a lethal load.

7. The Water Quality Criteria presented in Table D-8 may be changed within a short period of time to more restrictive values.

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UNITED STATES DEPARTMENT
OF THE INTERIOR
OFFICE OF THE SECRETARY
Washington, D.C. 20240

February 23, 1973

ER-72/1437

Dear Mr. Secretary:

This is in response to Mr. Smiley's letter of November 21, 1972, inviting our comments on the Atomic Energy Commission's report entitled "Environmental Survey of the Nuclear Fuel Cycle," dated November 1972.

We are pleased that the AEC has published this Environmental Survey of the Nuclear Fuel Cycle. Much of the data given in this report is needed to supplement information normally given in environmental statements for individual nuclear reactors. However, since the report must cover such a wide spectrum to supply the information lacking in the individual environmental evaluations, we believe that the November 1972 issue should be significantly enlarged and modified if it is to fill the present need.

*General*

The discussion of the effects on the environment are in most instances very general in this report. We recognize that separate environmental statements on individual operations go into greater detail.

There is an implication throughout the document that the "environment" begins and ends at the site boundary of any nuclear facility; hence, any release will have no environmental effect if it is confined within the site boundary.

There are a vast number of retention ponds, settlement basins, and tailing ponds described throughout the report,

the construction of which do not appear to be limited to any engineering standards. These various impoundments contain large volumes of fluids and particulate matter of various degrees of activity and toxicity. The history of failures of such facilities is vast and many have resulted in widespread and significant environmental damage. The assumption is made for several operations that chemical or radioactive wastes buried or held in retention ponds will not give rise to effluents and will have no environmental effects. We do not think that this assumption is generally acceptable. Long-term action of ground and surface water on these wastes should be considered and evaluated before such an assumption is made.

Although the release of radionuclides is closely controlled as to concentration, much of this control is exercised by dilution in the medium to which they are released; hence, appreciable quantities may be released, albeit, in low concentrations. This rationale does not give consideration for the possibility that reconcentration of these radionuclides can take place within the natural systems to which they are released.

The report also appears to omit the consideration of some operations which are part of the fuel cycle. Among these are the solidification of high-level wastes, cleanup operations after accidents involving radioactive materials, and eventual disposal of major contaminated components of facilities.

The solidification of liquid high-level wastes, while not presently operational, will soon be a required step in the fuel cycle. It would appear that the subject report should include consideration of potential wastes or accidents involved in this operation.

Accidents at nuclear facilities, including reactors, are likely to produce radioactive liquids or solids that must

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be further treated or stored. Cleanup operations inside or outside the plants and those associated with mining operations involve cleanup operations as well as disposal of damaged or contaminated facilities. The report should consider the quantities of contaminated materials that might be involved and the effects of their disposal.

We think the report should also consider the effects of the eventual disposal of contaminated facilities and major components after the end of their useful life. Such consideration for elements such as reactor components would be included since the effects of decommissioning are not usually evaluated in the environmental statements issued for individual reactors.

The report also deals with the disposition of high-level radioactive wastes and purified plutonium but does not describe the enormous potential for damage to the environment that is inherent in these materials. Without discussion of the nature of these dangers, it is not possible to evaluate the adequacy of the procedures intended to avoid them. Since these dangers are not usually discussed in environmental statements on individual operations of nuclear reactors, any overall coverage, such as appears to have been the intent of this report, should be thorough and detailed.

This survey report uses average statistics based on the present production situation. Since much of this production is committed to meeting existing uranium needs, we think that it would be more realistic to project the production cycle based on the life of future new plants.

Throughout the document, reference is made to land used for a particular phase of the nuclear fuel cycle as temporary. Since much of the lands used in the nuclear fuel cycle requires fencing or considerable elapsed time before it can be rehabilitated, we believe that the use of the term "temporary" is misleading. We suggest that such lands

be labeled as "restricted for future use." Also, a better assessment would be made if the area of such lands were totaled and shown in the report according to the level of restrictive use and length of time involved.

Our detailed comments are presented according to the format of the report.

*Summary*

Figure S-1, on page S-3, indicates that 4.6 acres of land is permanently committed annually per 1,000 MW plant. This assumes revegetation of the spoils and backfilling much of the pit. Industry's record does not substantiate this assumption. A more realistic figure is much greater than 4.6 acres as indicated in our general comments.

*Uranium Mining*

The indication on page A-15 that the bulk of the water pumped from the mines is recycled and returned to the groundwater from which it came is questionable. The common practice is to divert the pumped water to the nearest surface drainage. Some infiltration to groundwater may occur but usually at some point further downstream.

Mine dewatering may or may not have significant effects, but there is no evidence in the report that an effort was made to evaluate such effects.

This section ignores prospecting and exploration stages of the mining operation. These operations would affect much larger areas than the actual mining although to a smaller degree.

Industrial accidents and health hazards are not considered. This factor would be significant in the underground mining such as the Grants District in New Mexico. In open-pit mines, radon is usually not a problem; however,

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radioactive dust may adversely affect the health of the employees involved with the mining.

If a mill is associated with the mine, some of the water pumped from the workings may be used in the milling process. However, regardless of whether this is the case, the waste water (often containing low levels of radioactivity and acids) is usually discharged into the nearest dry wash from which it eventually seeps into the ground. We think that the depths at which the water looses the radioactive content, including daughter products, should be given along with the effects of the radioactivity on the environment.

Since most uranium mining is on private land or mining claims of Federal land, it is subject only to State laws and the operator's actions. Performance in the past has been poor although there is evidence of improvement. We understand that efforts are being made to slope and revegetate spoil-piles in the Shirley Basin area in Wyoming but do not know of any similar plans for the Gas Hills area, Wyoming, or the open pit operations in the Four Corners area. Any AEC regulations and the method of enforcement should be discussed in regard to mining operations.

*Uranium Milling*

The first paragraph on page B-17 includes a brief discussion of the liquid effluent from the mill but does not discuss the quantities of chemicals discharged to tailing ponds and their effect on surface and groundwater for the long term.

Although the concentrations of airbourne radioactive effluents released into the environment from processing operations are limited, the effects of the deposition of airbourne radium-226, thorium-230, and other longlived radionuclides near the mill should be evaluated.

The storage of liquid and solid wastes in the retention ponds will lead to an accummulation of alpha-emitting radionuclides amounting to more than 6,300 curies. The report indicates that wells are used to monitor groundwater contamination. Although we are not advocating the discontinuance of well monitoring, we think that it is doubtful that wells can do more than detect contamination after it has occurred. Due to the longlived nature of these radionuclides, this contamination could persist for long periods of time and eventually some of the stored radionuclides would enter the groundwater or be flushed downstream by flood waters. We think the report should have evaluated the extent of contamination that has a reasonable possibility of occurrence.

The effects of a catastrophic failure of the low-head dam holding the tailings are discussed on page B-23. The volume of tailings and the magnitude of impacts resulting from the break of the dam should be indicated.

*Uranium Hexafluoride Production*

We do not think that the chemical and radiochemical composition and annual quantity of the raffinate are adequately defined. The quantity and composition of the sludges in the raffinate retention ponds and their eventual fate should also be described.

*Uranium Enrichment*

According to pages D-24 and D-25, sludges from holding ponds are buried on site. We think that the composition of these sludges and the potential effects on groundwater should also be described.

*Fuel Fabrication*

According to the second paragraph on page E-24, the calcium fluoride precipitate is buried at the fuel fabrica-

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tion plant site. The potential effects on groundwater should have been considered.

*Irradiated Fuel Reprocessing*

It is stated on pages F-26 and F-27 that solid wastes containing fission products, uranium, and plutonium will be stored or buried onsite in recoverable form or may be shipped to a Federal repository. The total quantities of radionuclides should be estimated and potential effects on groundwater of onsite burial should have been considered.

*Radioactive Waste Management*

It is indicated on page G-3 that no effluents to the offsite environment are expected to result from burial of waste classified as "other than high level." It would appear that the specific criteria and safeguards which will be used should also be described in the report.

Burial-site suitability is said to depend on factors assuring that there will be no migration of radionuclides from the site. Ultimately, migration cannot be avoided. The level of significance depends on the physical and chemical character and longevity of the wastes as well as on geologic and hydrologic conditions. The report should have considered the waste characteristics and quantities in evaluating potential effects.

Since some existing burial facilities are located in Illinois, Kentucky, South Carolina, and New York and are exposed to a generally humid climate; it does not appear that the description of the model facility given on page G-12 is realistic. Periods of intense precipitation causing flooding to any exposed trenches are likely to occur in all of these States.

We hope these comments will be helpful to you.

Sincerely yours,

/s/ [Illegible]
Deputy Assistant Secretary
of the Interior

Secretary Paul C. Bender
U.S. Atomic Energy Commission
Washington, D. C. 20545

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ADMINISTRATIVE CONFERENCE OF THE UNITED STATES

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OFFICE OF
THE CHAIRMAN

## RECOMMENDATION NO. 76-3: PROCEDURES IN ADDITION TO NOTICE AND THE OPPORTUNITY FOR COMMENT IN INFORMAL RULEMAKING.

(Adopted June 3-4, 1976)

The Conference's Recommendation 72-5 stated that in rulemaking of general applicability involving substantive rules "Congress ordinarily should not impose mandatory procedural requirements other than those required by 5 U.S.C. § 553," and that "Congress should never require trial-type procedures for resolving questions of policy or of broad or general fact." Paragraph 5 of the Recommendation recognized that agencies nevertheless may sometimes appropriately utilize such procedures for resolving issues of specific fact, and it counseled that in rulemaking proceedings of general applicability "each agency should decide in the light of the circumstances of particular proceedings whether or not to provide procedural protections going beyond" the notice-and-comment requirements of Section 553, "such as opportunity for oral argument, agency consultation with an advisory committee, opportunity for parties to comment on each other's written or oral submissions, a public-meeting type of hearing, or trial-type hearing for issues of specific fact."

The present Recommendation enlarges upon paragraph 5 of Recommendation 72-5 by further specifying for agency consideration certain procedures going beyond

notice-and-comment, and by describing some of the "circumstances of particular proceedings" that should move agencies to consider such additional procedures.

The Recommendation grows out of a study of decisions, primarily of the Court of Appeals for the District of Columbia Circuit, in which rulemaking proceedings have been remanded to agencies for additional procedures, and of the responses of the affected agencies. The Recommendation implies no view as to whether those decisions were authorized by the Constitution or relevant statutes. The Recommendation is premised, however, on the view that one can learn from the insights of judges, who on the basis of their study of records reflecting "the circumstances of particular proceedings," perceived a need for procedures in addition to notice and the opportunity for comment, and from the experience of agencies required to provide such additional procedures.

*Recommendation*

1. Agencies should afford interested persons the opportunity to participate as effectively as possible in notice-and-comment rulemaking proceedings. Therefore, in order to enlarge the opportunity for public participation and increase its effectiveness, agencies in appropriate circumstances should utilize procedures such as the following, which go beyond a single notice and opportunity to comment and supplement or particularize those listed as examples in Recommendation 72-5.[1]

a. Providing from the outset for the possibility of two cycles of notice-and-comment (i) when the agency anticipates that the issues raised by the rulemaking will be

[1] This Recommendation is addressed solely to agency process *prior* to the final promulgation of a rule. In addition, the agency statement of the basis and purpose of the rule incorporated in the rule when it adopted should be clear and complete and should fully and fairly inform the public as to the basis and purpose of the rule.

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unusually complex, or (ii) when it is in the public interest to utilize the initial notice of proposed rulemaking to give only a general description of the subjects and issues involved in the proceeding and to invite public comment upon those subjects and issues; provided that at the conclusion of the first cycle the agency may take any action within its powers. In addition an agency may at any time announce, as by an "advance notice of proposed rulemaking," that it intends to issue a notice of rulemaking, and in such announcement solicit comments and suggestions with respect to the contents of such notice.

b. Providing for a second cycle of notice-and-comment or by notice providing an opportunity for additional comment in any proceeding when comments filed in the proceeding, or the agency's response to such comments, present new and important issues or serious conflicts of data. An agency should consider the desirability of responding to comments as a means of exposing the agency's tentative views in order to enhance the usefulness of further comments by the public.

c. Incorporating in the notice of notice-and-comment cycle a summation of the agency's current attitudes toward critical issues in the proceeding and a description of the data on which the agency relies, indicating where the data may be inspected.

d. Providing an explanation of the tests and other procedures followed by the agency and the significance the agency has attached to them, and allowing opportunity for comment thereon.[2]

e. Holding conferences open to the public, on adequate notice, when an opportunity for all interested

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[2] This may be accomplished, for example, in a public notice or by technical reports issued or relied upon by the agency and incorporated by reference in the proceeding.

groups (such as agency staff, directly affected persons, agency policy-makers and public interest groups) to question one another would be effective in resolving, narrowing or clarifying the disputed issues.

f. Hearing argument and other oral presentation, when the presiding agency official or officials may ask questions, including questions submitted by interested persons.

Important circumstances tending to suggest the desirability of using such procedural devices are that (1) the scientific, technical or other data relevant to the proposed rule are complex; (2) the problem posed is so open-ended that an agency may profit from receiving diverse public views before publishing a proposed rule for final comment; and (3) the costs that errors in the rule may impose, including health, welfare and environmental losses imposed on the public and pecuniary expenses imposed on the affected industries and consumers of their products, are significant.

2. In rulemaking proceedings subject to notice-and-comment requirements agencies should give interested persons an opportunity to indicate issues of specific fact as to which they contend that cross-examination should be considered by the agency to be appropriate. Cross-examination, where permitted, should be strictly limited as to subject and duration.

3. An agency should employ any of the devices specified in paragraph 1 or permit cross-examination only to the extent that it believes that the anticipated costs (including those related to increasing the time involved and the deployment of additional agency resources) are offset by anticipated gains in the quality of the rule and in the extent to which the rulemaking procedure will be perceived as having been fair.

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FOR IMMEDIATE RELEASE APRIL 7, 1977

OFFICE OF THE
WHITE HOUSE PRESS SECRETARY

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THE WHITE HOUSE
REMARKS OF THE PRESIDENT
ON NUCLEAR POWER POLICY
AND
QUESTION AND ANSWER SESSION

THE BRIEFING ROOM
[TRANSCRIPT]

11:20 A.M. EST

THE PRESIDENT: Good morning, everybody.

I have two items to discuss with you this morning, and then I would like to answer a few questions.

One relates to the economy and the need for continuing emphasis on the stimulation package. Based on the best information available to us now, we will have an accumulated spending shortfall for this current fiscal year, fiscal year 1977, plus revenue collections in excess of the anticipated amount of about $10 billion. In other words, we have collected about $10 billion more from the American taxpayers than we anticipate spending in 1977.

I feel very strongly that this money should go back to the American taxpayers. We need it for the economy to maintain its present strength and the only equitable way that I see is through the already-prepared tax refund which would average about $50 per person which, as I have said before, would be about 30 percent of the 1976 income taxes paid by a family making about $10,000 a year.

The second point I would like to make before I answer questions is concerning our Nation's effort to control the spread of a nuclear explosive capability. As far back as 30 years ago, our Government made a proposal to the United Nations that there would be tight international controls over nuclear fuels and particularly those that might be made into explosives.

Last year during the Presidential campaign, both I and President Ford called for strict controls over fuels to prevent the proliferation, further proliferation, of nuclear explosive capability.

There is no dilemma today more difficult to address than that connected with the use of atomic power. Many countries see atomic power as their only real opportunity to deal with the dwindling supplies of oil, the increasing price of oil and the ultimate exhaustion of both oil and natural gas.

Our country is in a little better position. We have oil supplies of our own and we have very large reserves of coal. But even coal has its limitations, so we will ourselves continue to use atomic power as a share of our total energy production.

The benefits of nuclear power, particularly to some foreign countries that don't have oil and coal of their own, are very practical and critical. But a serious risk is involved in the handling of nuclear fuels—the risk that component parts of this power process will be turned to providing explosives or atomic weapons.

We took an important step in reducing this risk a number of years ago by the implementation of the nonproliferation treaty which has now been signed by approximately 100 nations. But we must go further.

We have seen recently India evolve an explosive device derived from a peaceful nuclear power plant, and we now

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feel that several other nations are on the verge of becoming nuclear explosive powers.

The United States is deeply concerned about the consequences of the uncontrolled spread of this nuclear weapon capability. We can't arrest it immediately and unilaterally. We have no authority over other countries. But we believe these risks would be vastly increased by the further spread of reprocessing capabilities of the spent nuclear fuel from which explosives can be derived.

Plutonium is specially poisonous and, of course, enriched uranium, thorium and other chemicals of metals can be used as well.

We are now completing an extremely thorough review of our own nuclear power program. We have concluded that serious consequences can be derived from our own laxity in the handling of these materials and the spread of their use by other countries, and we believe that there is strong scientific and economic evidence that a time for a change has come.

Therefore, we will make a major change in the United States domestic nuclear energy policies and programs which I am announcing today.

We will make a concerted effort among all other countries to find better answers to the problems and risks of nuclear proliferation, and I would like to outline a few things now that we will do specifically.

First of all, we will defer indefinitely the commercial reprocessing and recycling of the plutonium produced in U. S. nuclear power programs.

From my own experience, we have concluded that a viable and adequate economic nuclear program can be maintained without such reprocessing and recycling of plutonium. The plant at Barnwell, South Carolina, for

instance, will receive neither Federal encouragement nor funding from us for its completion as a reprocessing facility.

Second, we will restructure our own U. S. breeder program to give greater priority to alternative designs of the breeder other than plutonium, and to defer the date when breeder reactors would be put into commercial use.

We will continue research and development, but shift away from plutonium, defer dependence on the breeder reactor for commercial use.

Third, we will direct funding of U. S. nuclear research and development programs to accelerate our research into alternative nuclear fuel cycles which do not involve direct access to materials that can be used for nuclear weapons.

Fourth, we will increase the U. S. capacity to produce nuclear fuels, enriched uranium in particular, to provide adequate and timely supplies of nuclear fuels to countries that need them, so that they will not be required or encouraged to reprocess their own materials.

Fifth, we will propose to the Congress the necessary legislative steps to permit us to sign these supply contracts and remove the pressure for the reprocessing of nuclear fuels by other countries that do not now have this capability.

Sixth, we will continue to embargo the export of either equipment or technology that could permit uranium enrichment and chemical reprocessing.

And seventh, we will continue discussions with supplying countries and recipient countries, as well, of a wide range of international approaches and frameworks that will permit all countries to achieve their own energy needs while at the same time reducing the spread of the capabilities for nuclear explosive development.

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Among other things, we have discussed this with fifteen or twenty national leaders already; we will explore the establishment of an international nuclear fuel cycle evaluation program so that we can share with countries that have to reprocess nuclear fuel the responsibility for curtailing the ability for the development of explosives.

One other point that ought to be made in the international negotiation field is that we have to help provide some means for the storage of spent nuclear fuel materials which are highly explosive, highly radioactive in nature.

I have been working very closely with, and personally, with some of the foreign leaders who are quite deeply involved in the decisions that we make. We are not trying to impose our will on those nations like Japan, France, Britain and Germany, which already have reprocessing plants in operation.

They have a special need that we don't have in that their supplies of petroleum products are not available. But we hope that they will join with us, and I believe that they will, in trying to have some worldwide understanding of the extreme threat of the further proliferation of nuclear explosive capability.